

The Land of the Genetic Mutants

There are no humans left. Only the animals and vegetables have survived. They have mutated to talk and think like humans. However, there are still mutations occurring in the children.

Here is your project.

You have been given an animal/vegetable. You will use the template and make 1 father, 1 mother, and minimum of 1 child. The mother and father can have any characteristic such as eye color, fur/skin color, etc. However, each has some type of mutation. This mutation will be passed on to the children. You will decide what the specific mutation will be. **The mutation must be obvious when looking at your family.**

Materials provided to student:

Template of the organism
Template for chromosomes
Grading rubric

Construct a puppet for each parent and child. Follow the directions given as to how to make a puppet.

Decide what mutation your child will have. The mutation must be visible on the puppet.

Using the chromosome templates, show where the mutation would occur on the parents and child. Is it a sex-linked mutation (only from the father) or chromosomal mutation.

Using current & prior knowledge prepare the following for your family.

- Where do they live? (what type of ecological biome?) This must be represented in project.
- What do they eat and how do they obtain this food? (predator/prey? Autotroph? Heterotroph?)
- Is the mutation an advantage or a disadvantage?
- Prepare a DNA strand as a template for the mutation. (the nucleotide number must be the same as the number given in Table #1)
- Ex: ATT ACC GGT AAC
- Translate the DNA into mRNA. The mRNA into tRNA and then list what the tRNA codes for using the RNA wheel /chart given. If there is a triplet that does not code, then it is skipped. You must have a start and a stop codon at the beginning and end.
- Show where the mutation occurs on the strand of DNA and describe what type of mutation it is. Frameshift, point, deletion, insertion, translocation.

- Mutation and sex of offspring should be identified on the chromosome map diagram you prepare. Refer to data table #1 for the number of chromosomes your species has. A sample of a chromosome map will be give. The ones given as samples are for humans.
- Give the mutation a name.
- Draw a Punnett Square to represent the probability of the sex of the offspring.
- What sex is the offspring?
- Draw a Punnett Square to illustrate the probability of the parents passing the mutation to the offspring.
- Give the ratio of the probability. Ex: 1:2:1, 1:1, 3:1,
- What is the genotype of the mutation? Ex: AA, Aa, aa
- What is the phenotype of the mutation? Ex: horns, fangs, etc.
- In your presentation, have a 1-2 paragraph with information about your given species.
- Prepare a 3-5 minute puppet show for your family and be prepared to present this to the class either by recording it or presenting it in person.
- All information must either be compiled into a neat folder, put on a poster board, or placed on a three-fold board.
- Project can be done in groups of 1, 2, 3, or 4. No more than 4 per group.

Species	Chromosome pairs (diploid)
Beaver	50
Dragon	58
Duck	39
Elephant	56
Fish	49
Fox	50
Frog	36
Koala Bear	38
Lamb	54
Lion	38
Monkey	54
Moose	60
Pig	38
Potato	48
Rabbit	30

Raccoon	56
Reptile	34
Skunk	50
Spider	26
Squirrel	38

Students will be allowed 2 class periods for preparation. All other preparation will be done outside of class. All work must be done by students and the majority of the project cannot be done via computer. There will be a large supply of materials for you to use in the classroom.

I/We understand the project, what is expected and the date it is due. If for any reason one or more of the members of this group do not participate, we will inform the teacher. I also understand that this project will reflect 1/3 or 30% of my 9 weeks grade.

Organism: _____

Team members:

Project Check List

Puppets

_____ Mother

_____ Father

_____ Child(ren)

_____ Habitat

_____ Food source

Mutation

_____ What is the mutation

_____ Name of mutation

_____ Advantage/Disadvantage

_____ DNA strand (21 nucleotides)

_____ mRNA Strand

_____ tRNA Strand

_____ tRNA coded for amino Acids

Chromosomes

_____ Mother

_____ Father

_____ Child

_____ Mutation Shown

_____ Mutation identified

_____ Chromosome map shows mutation and sex of offspring

_____ Sex of Offspring

Punnett Square

- _____ Illustrates sex of child
- _____ Illustrates mutation
- _____ Ratio & probability shown

Genotypes

- _____ Mother
- _____ Father
- _____ Child

Phenotypes

- _____ Mother
- _____ Father
- _____ Child
- _____ Presentation
- _____ Folder, poster or tri-fold board

Projects are due on or before February 28/29, 2008 at the end of the school day. Projects will not be accepted late without a written note from parents describing why the project was not turned in on time.

Mutation Project
Grading Rubric

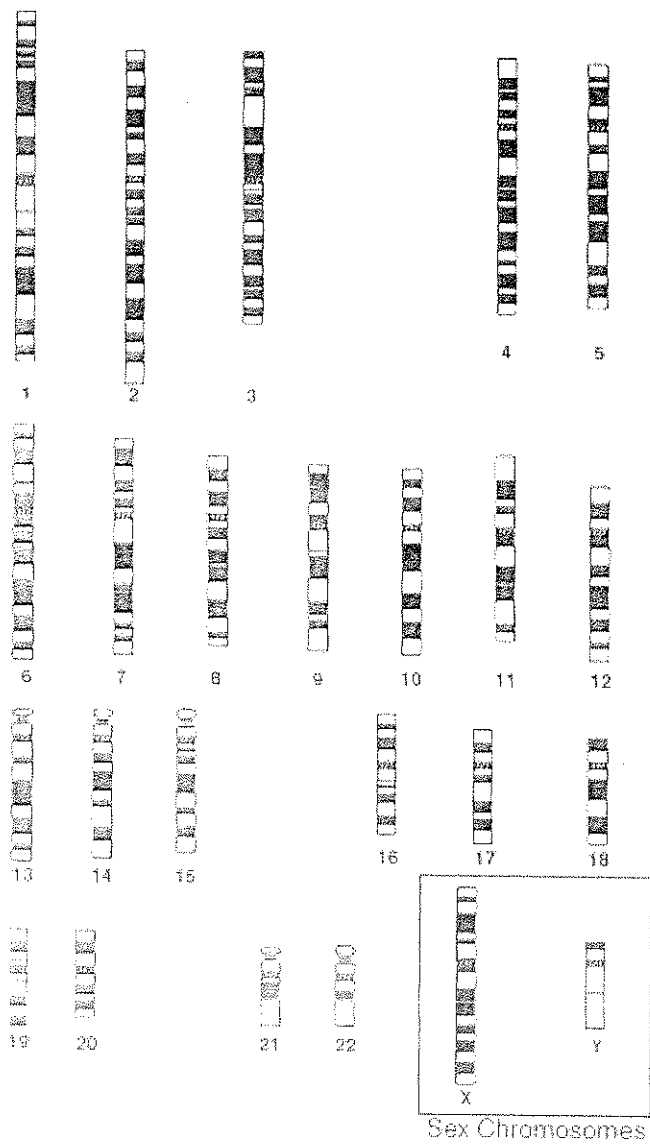
Organism: _____

Group members: _____

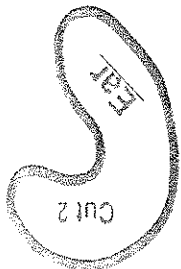
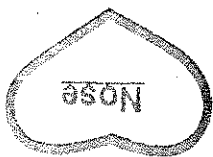
<i>Category</i>	<i>7</i>	<i>5</i>	<i>3</i>	<i>1</i>
Required Elements	The project includes ALL the required elements as well as additional information	ALL the required elements are included in the project	ALL but 1 of the required elements are included in the project	Several of the required elements are missing from the project
Labels	ALL items of importance on the project are clearly labeled with labels that are neat and can be read from a distance of 3 ft.	Almost ALL the items of importance on the project are clearly labeled with labels that can be read from at least 3 ft. away	Many of the items of importance on the project are clearly labeled with labels that can be read from at least 3 ft. away	Labels are too small to view or many of the important items are not labeled.
Graphics Relevance	ALL graphics are related to the topic and make it easier to understand. ALL downloaded/copied/borrowed graphics have the appropriate citations	ALL graphics are related to the topic and most make it easier to understand. Some of the graphics have not been cited appropriately.	ALL graphics relate to the topic. One or two borrowed graphics have a citation source.	Graphics do not relate to the topic or several borrowed graphics do not have a source citation.
Attractiveness	The project is exceptionally attractive in terms of design, layout and neatness.	The project is attractive in terms of design, layout and neatness.	The project is acceptably attractive though it may be a bit messy.	The project is distractingly messy or very poorly designed.
Grammar	There are no grammatical or mechanical errors on the project	There are only 1 or 2 grammatical or mechanical errors on the project	There are 3 to 4 grammatical or mechanical errors on the project	There are 4+ grammatical or mechanical errors on the project.
Puppets	Puppets are made with the supplied template and have	Puppets are made with the supplied template and have	Puppets are made with the supplied template and have	Puppets are made. Mutation is not obvious. No

	ALL members of the family with the mutation clearly visible. Materials used for puppets exhibit originality and imagination in design.	ALL members of the family with them mutation clearly visible. Design shows some originality. And imagination	ALL members of the family. Mutation is not obvious. Design lacks originality imagination.	originality or imagination in preparation of puppets.
Puppet show	Show clearly states the purpose of the project and reflects time and effort as well as outside research. Program is 3-5 minutes long.	Show states the purpose of the project. Shows adequate time and effort. Uses very little outside research. Program is 3-5 minutes long.	Show states the purpose. Shows little extra effort. Program does not meet the time length.	Show does not state the purpose. Shows no extra effort. Program does not meet the time length.
Points received:				
Total points:		-----	-----	-----
Total points x 2.5		-----	-----	-----

1	2	3	4	5
6	7	8	9	10
11	12	13	14	15
16	17	18		
19	20	21	22	x
				x

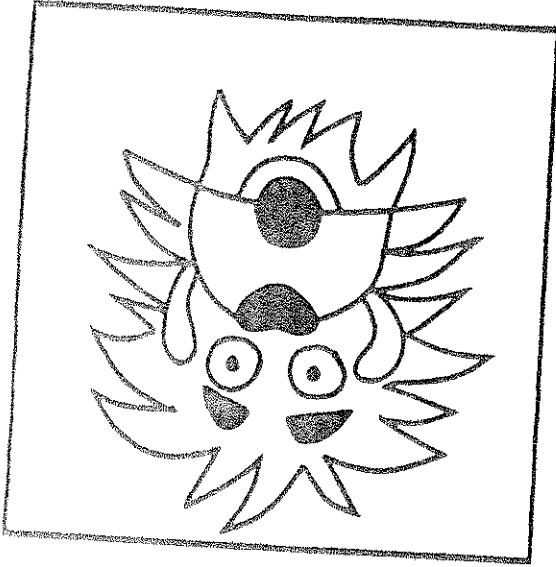


MONKEY

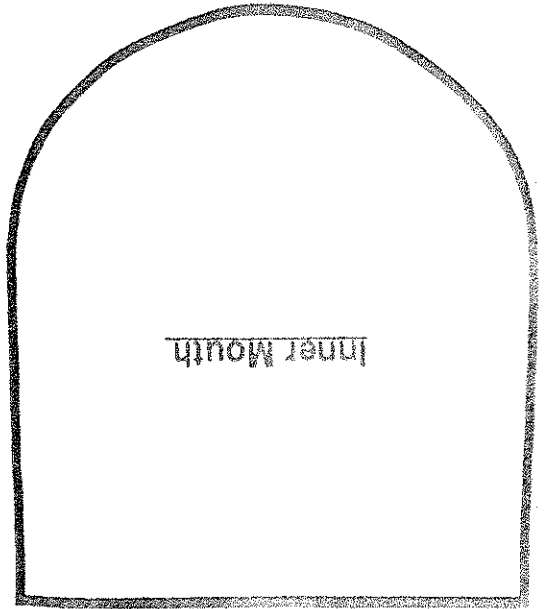


Inner Eye

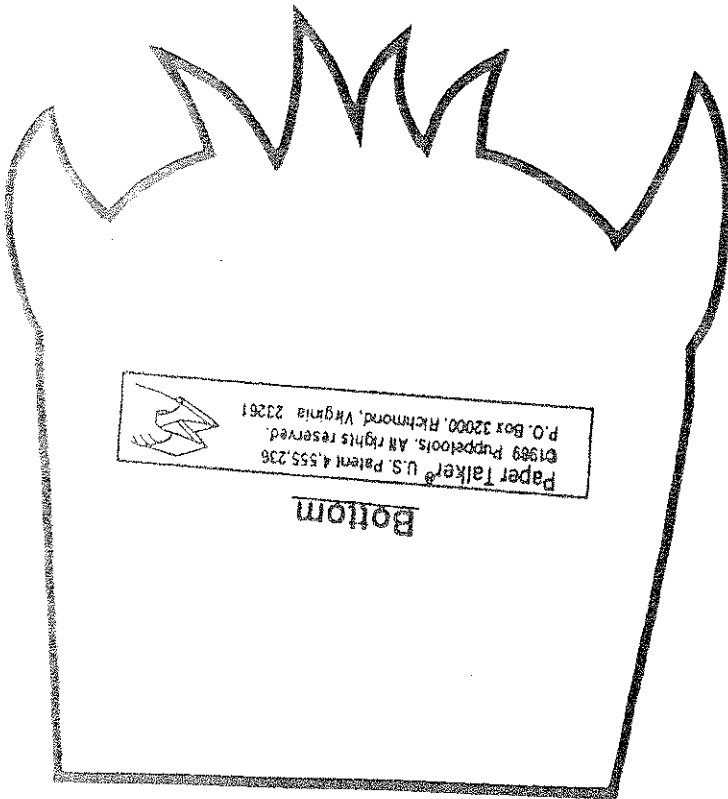




MONKEY PAGE 2

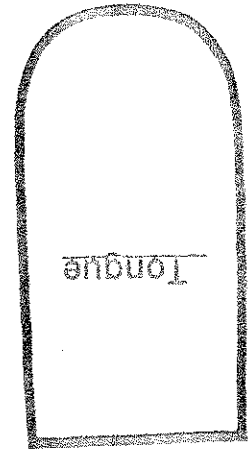


Inner Mouth

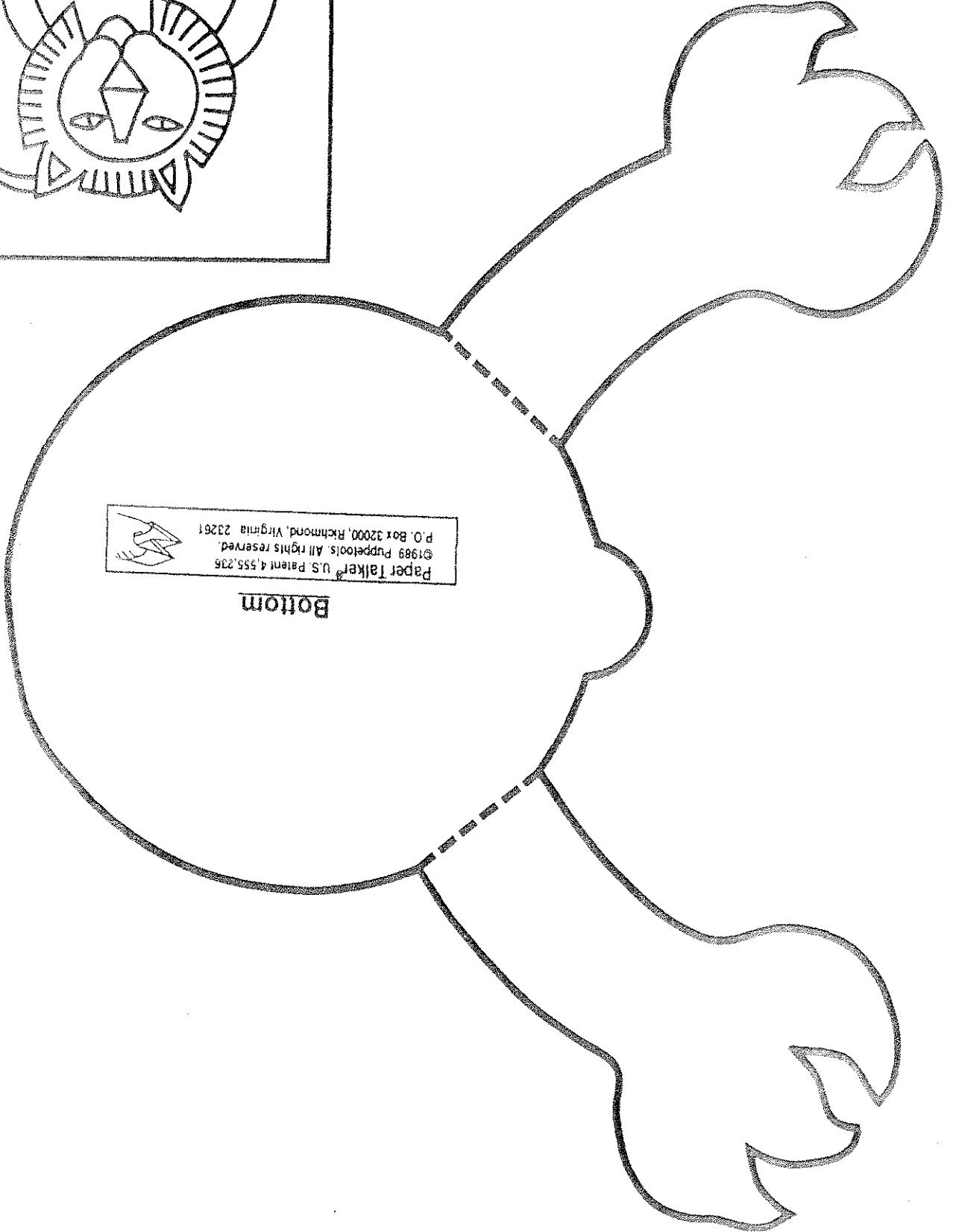
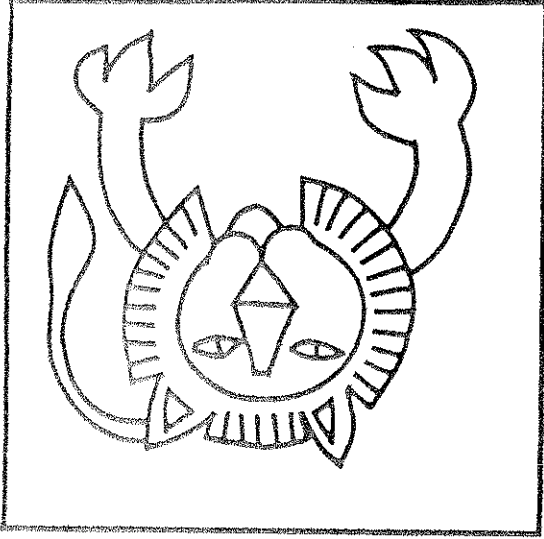



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Bottom



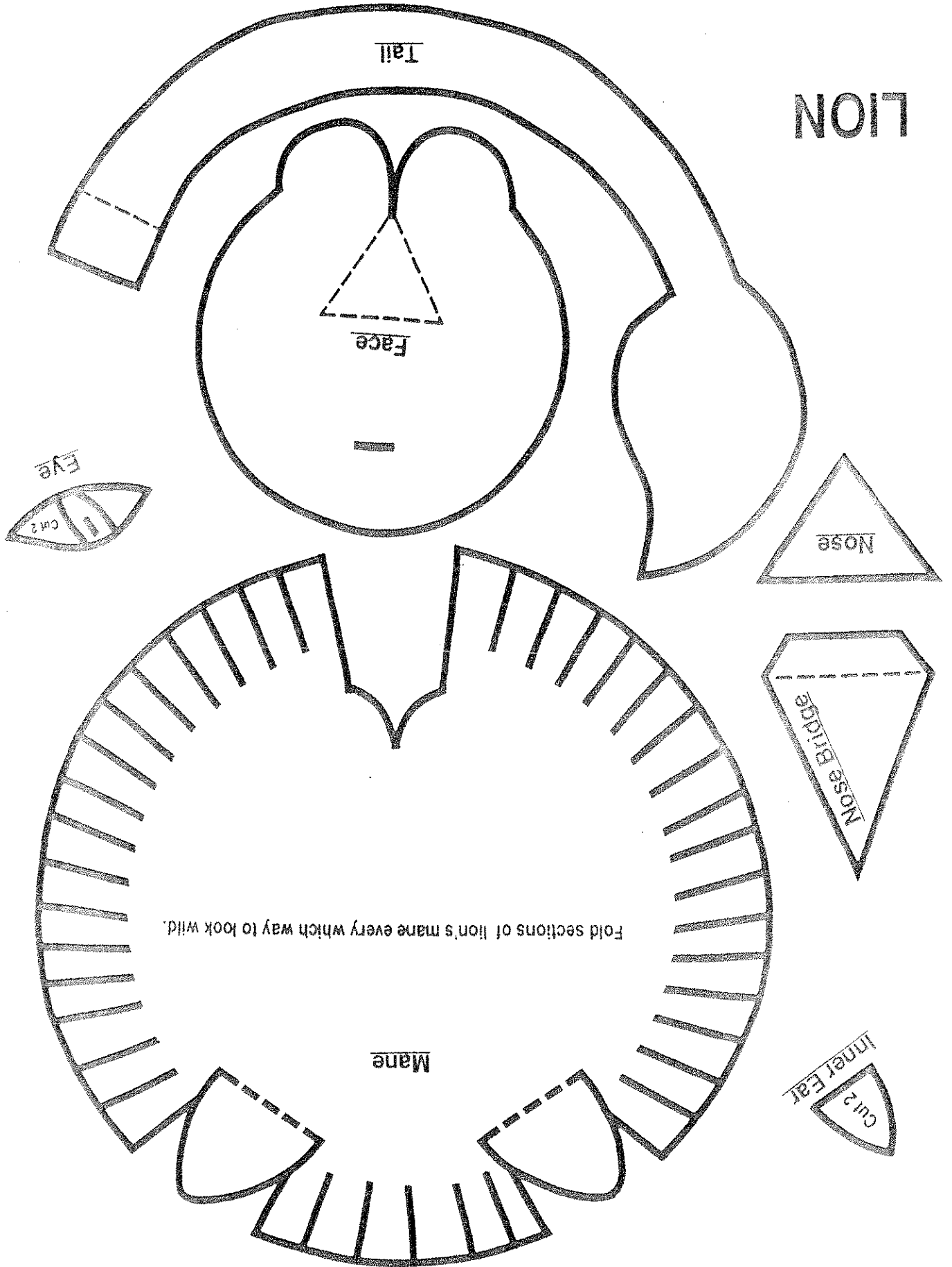
Tongue



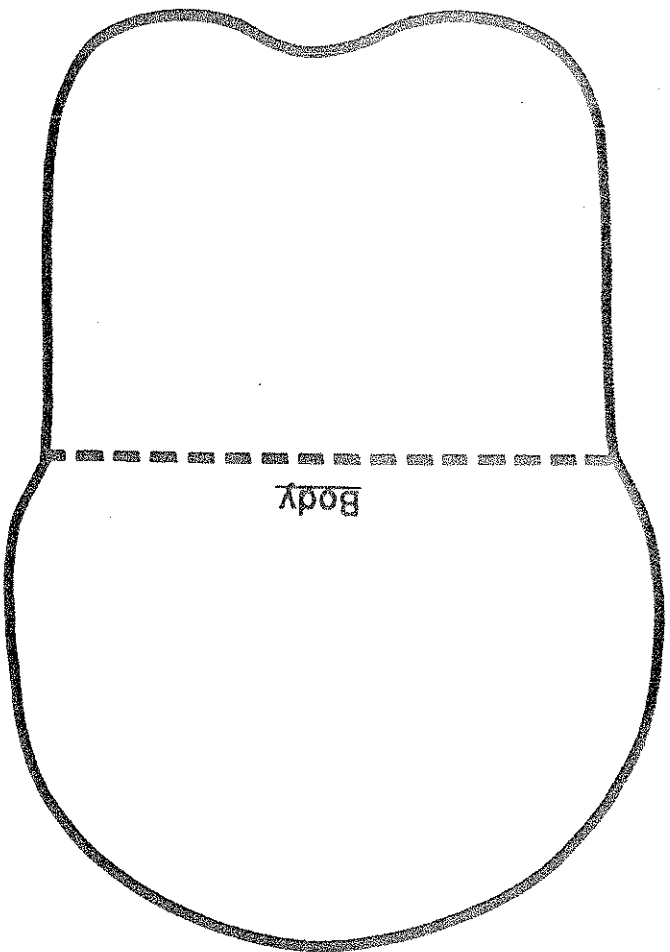
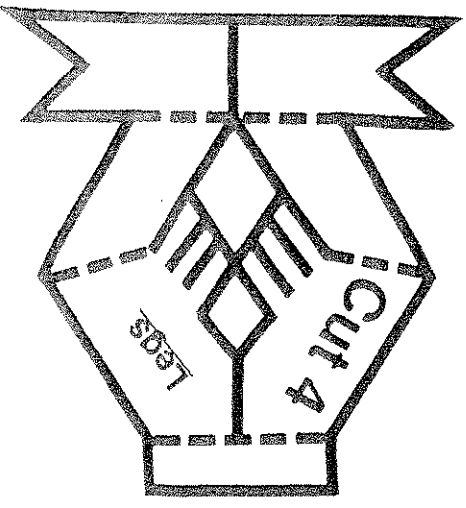
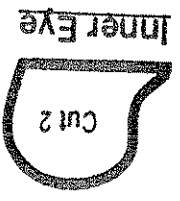
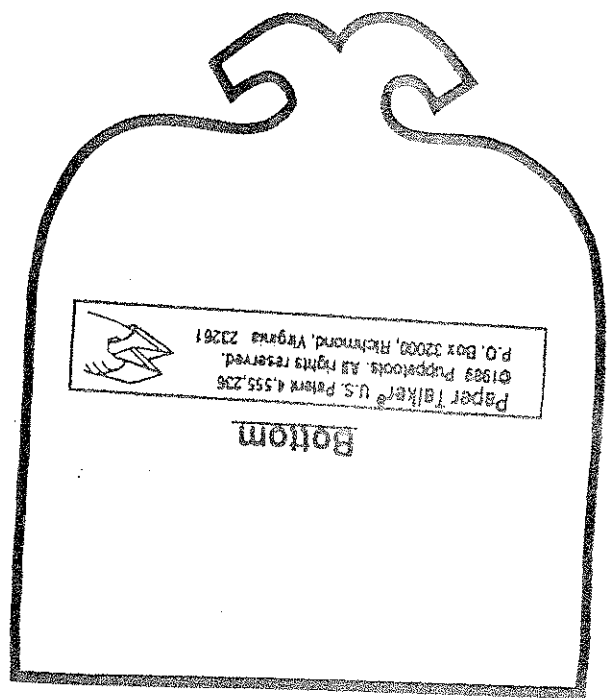
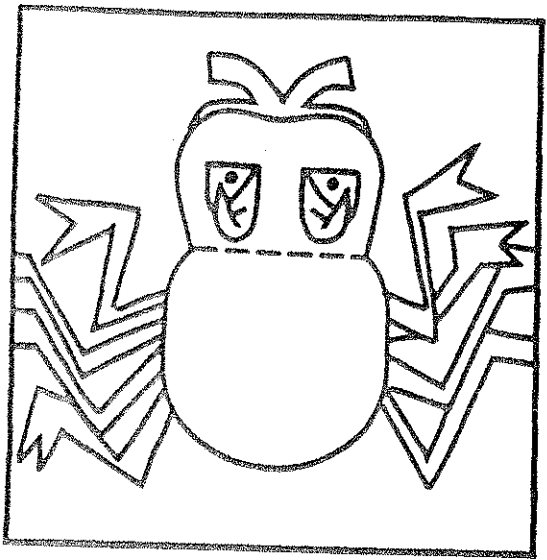
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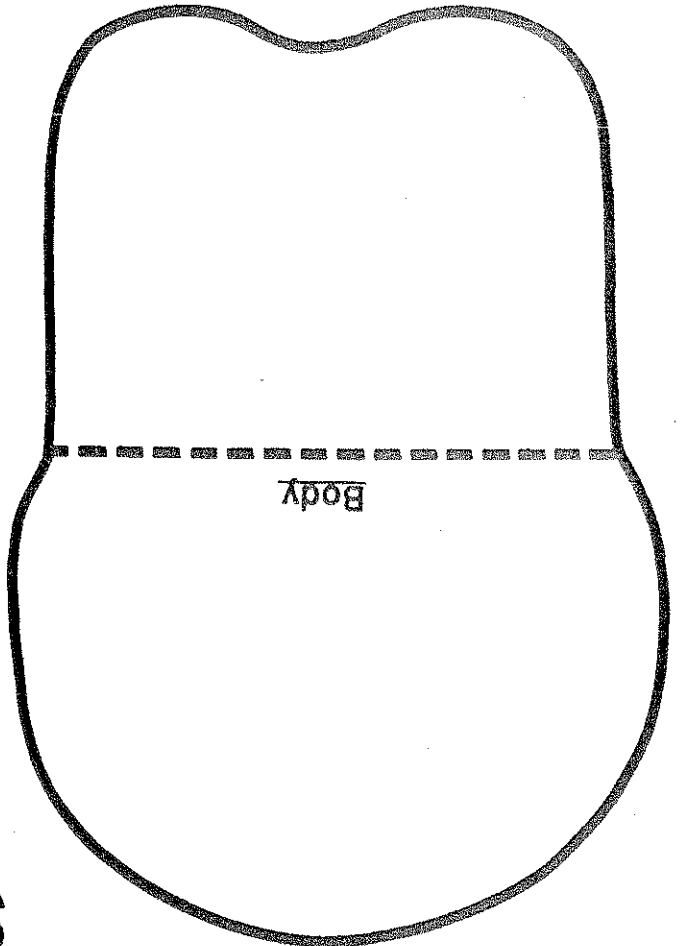
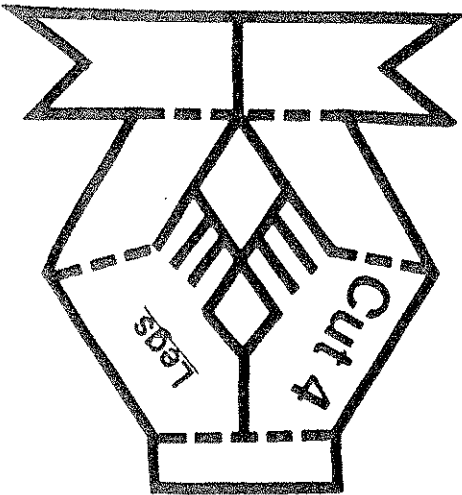
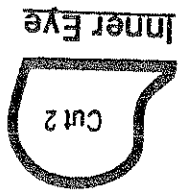
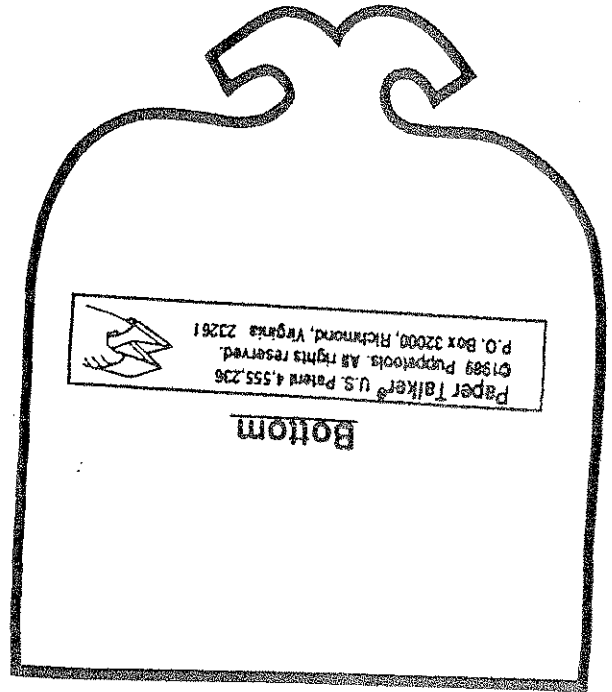
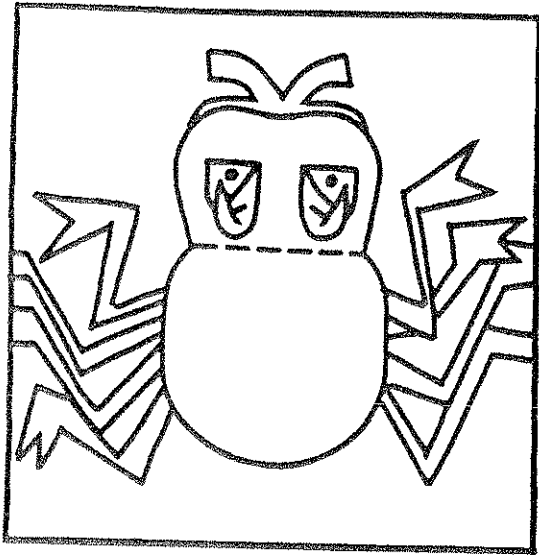
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LION

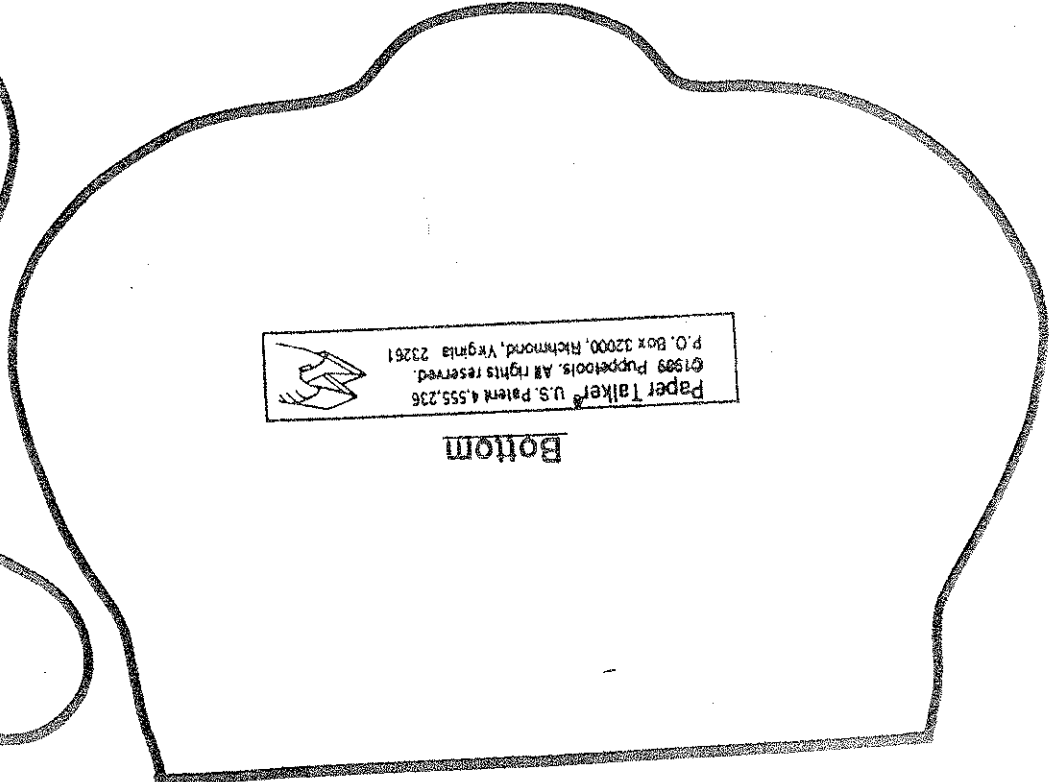



SPIDER

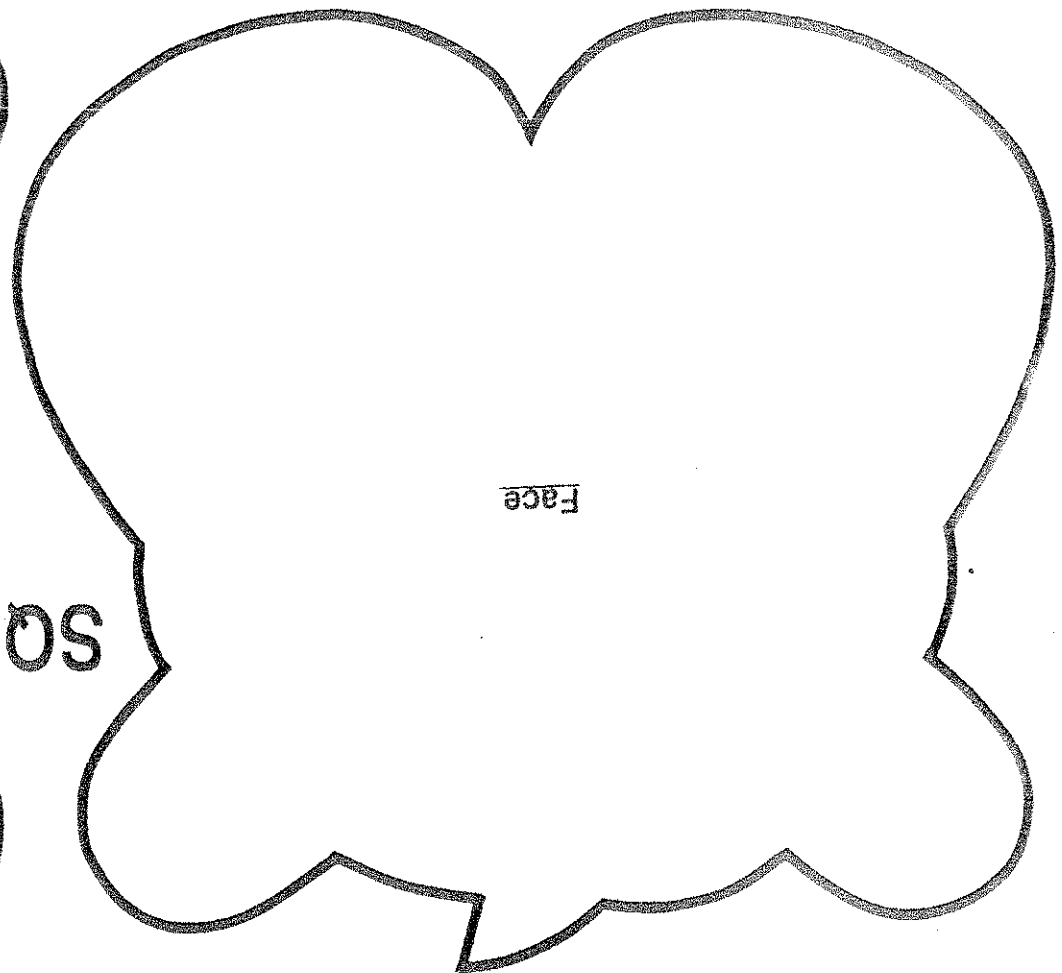
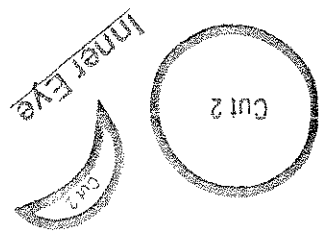
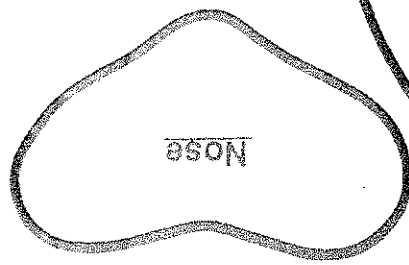




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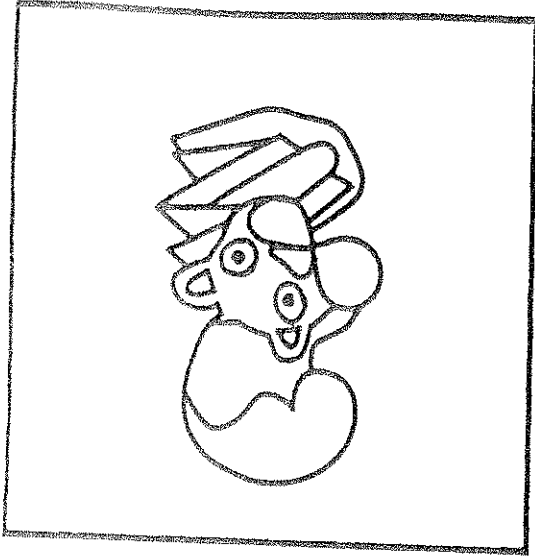


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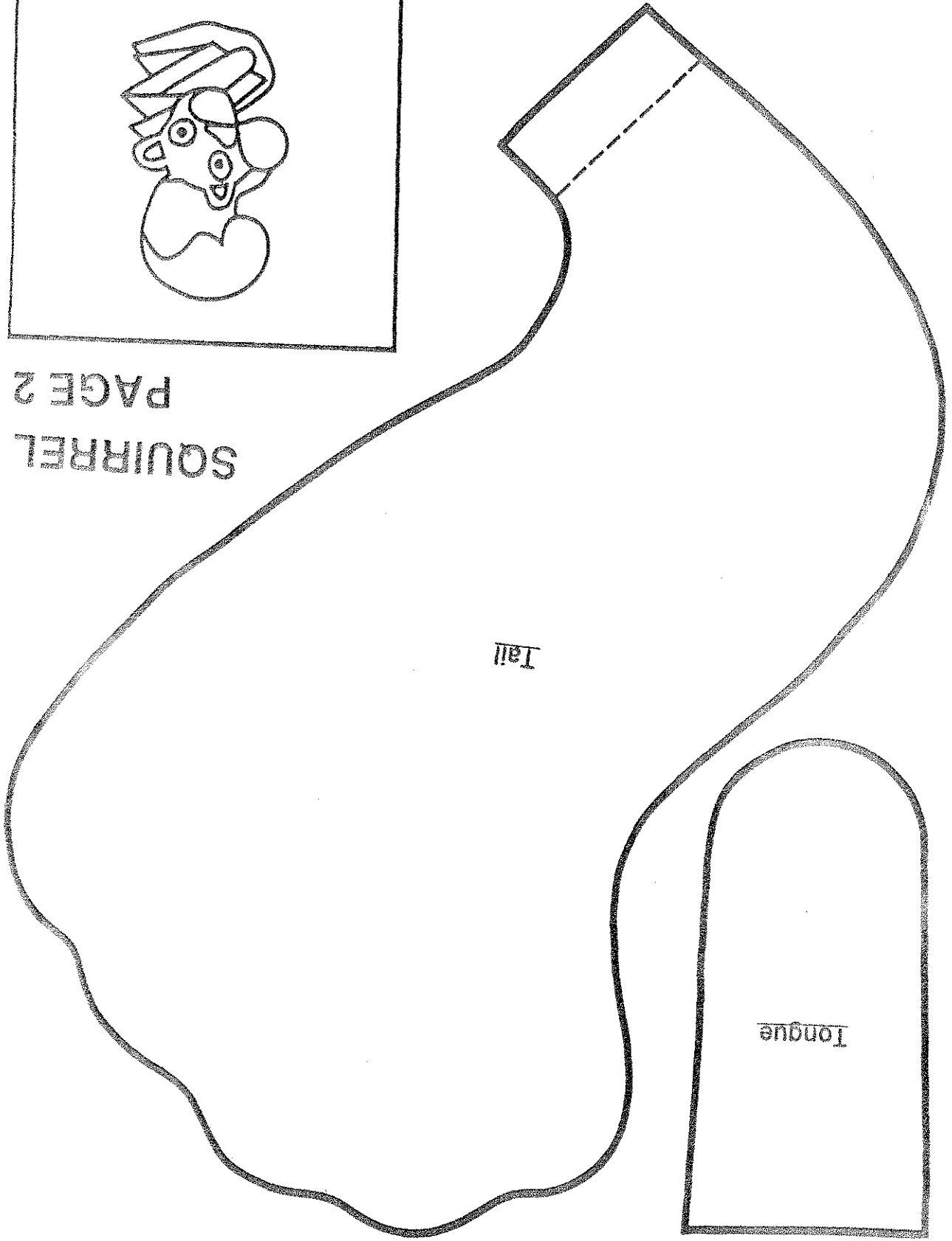
SQUIRREL





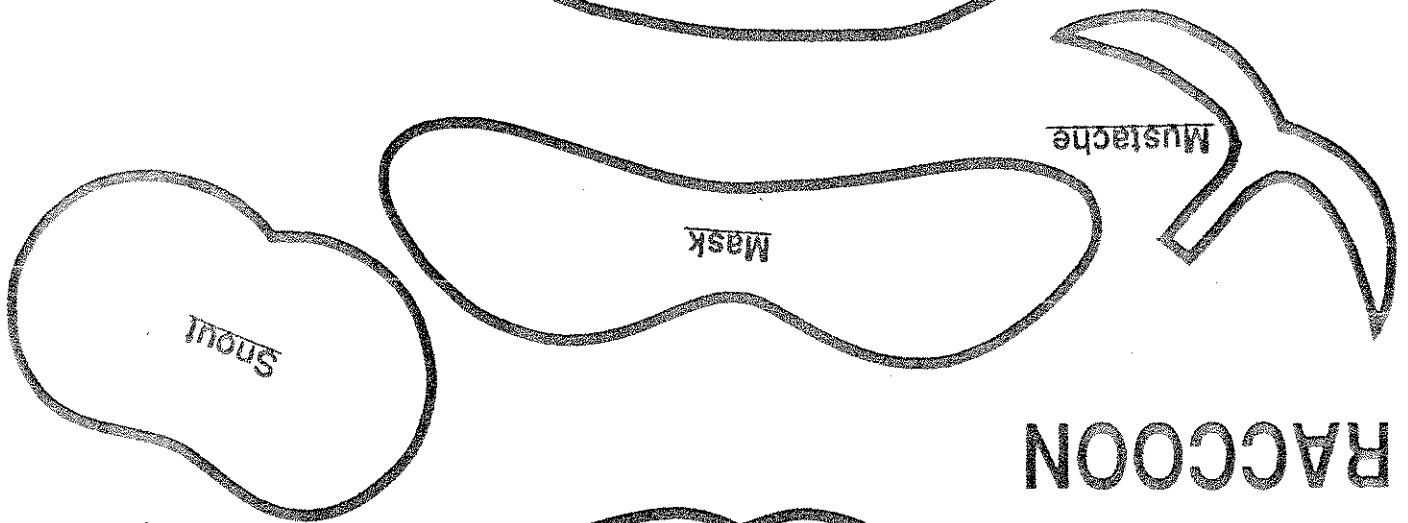
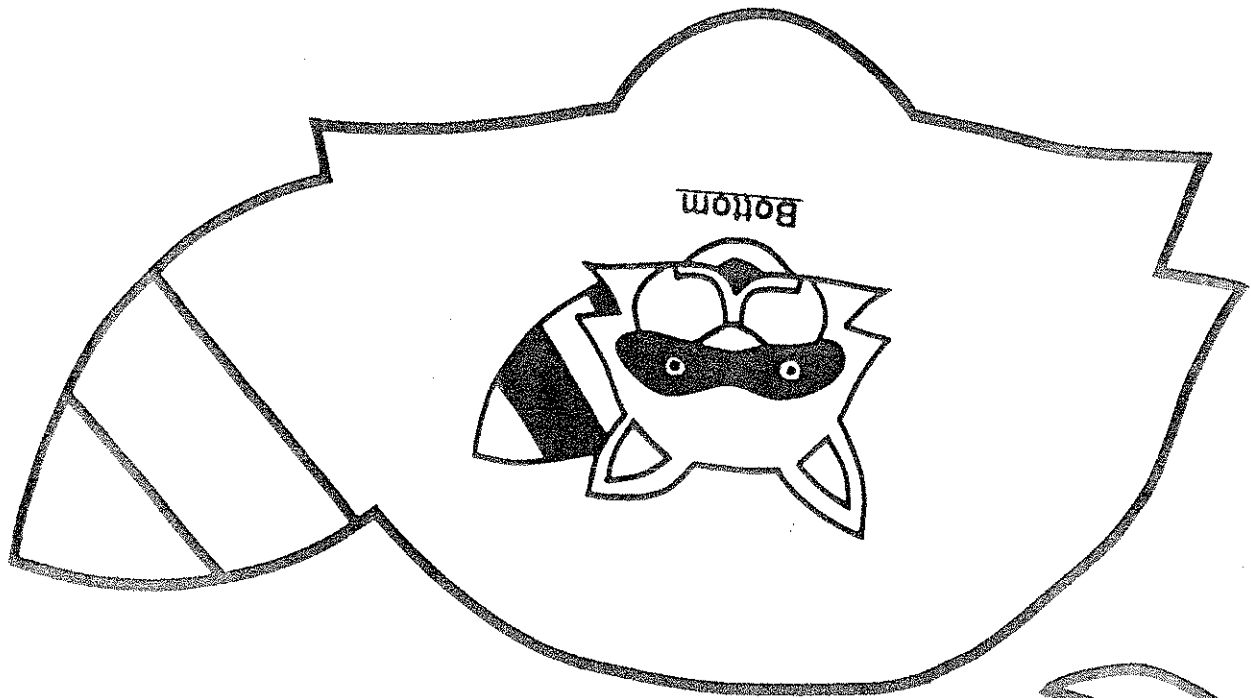
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SQUIRREL

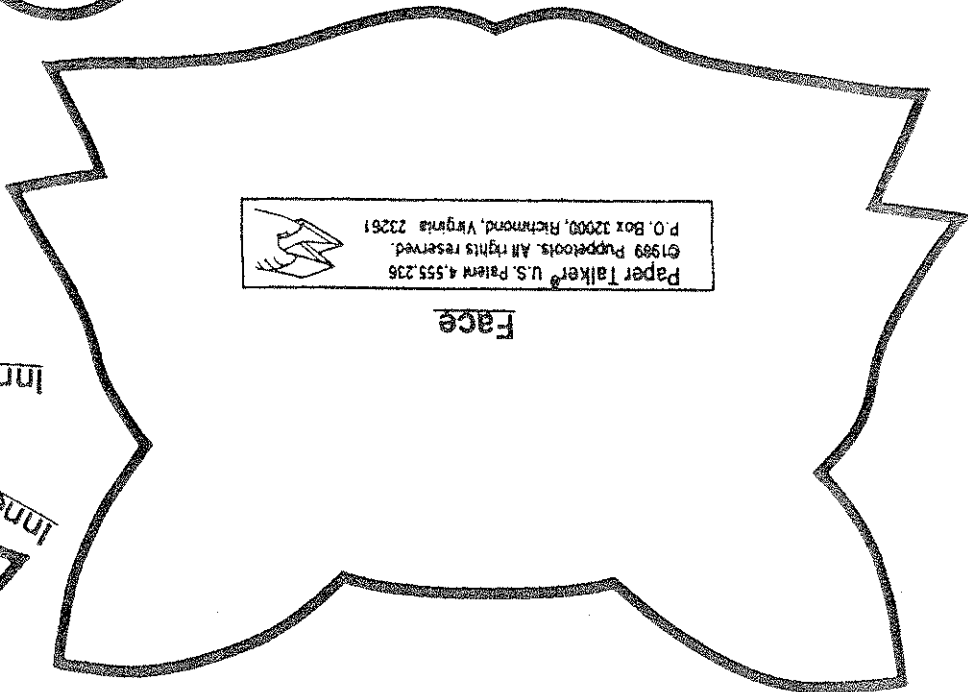
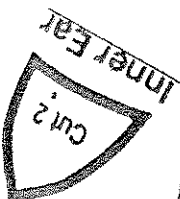


Tail

Tongue



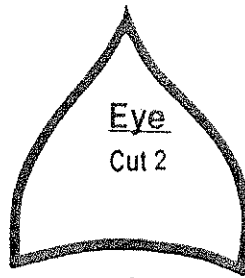
RACCOON



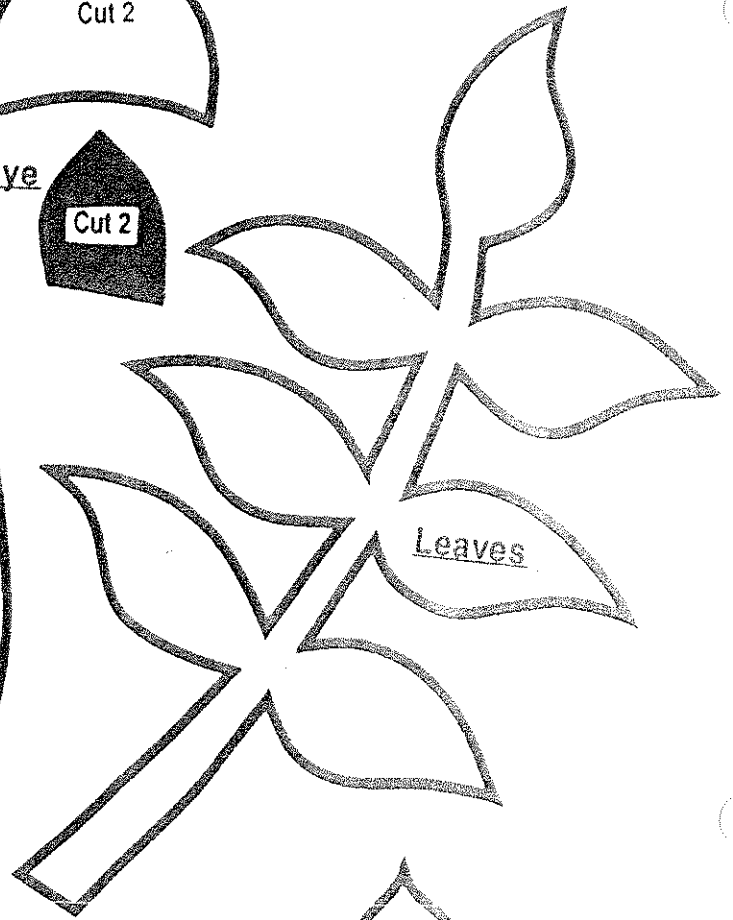
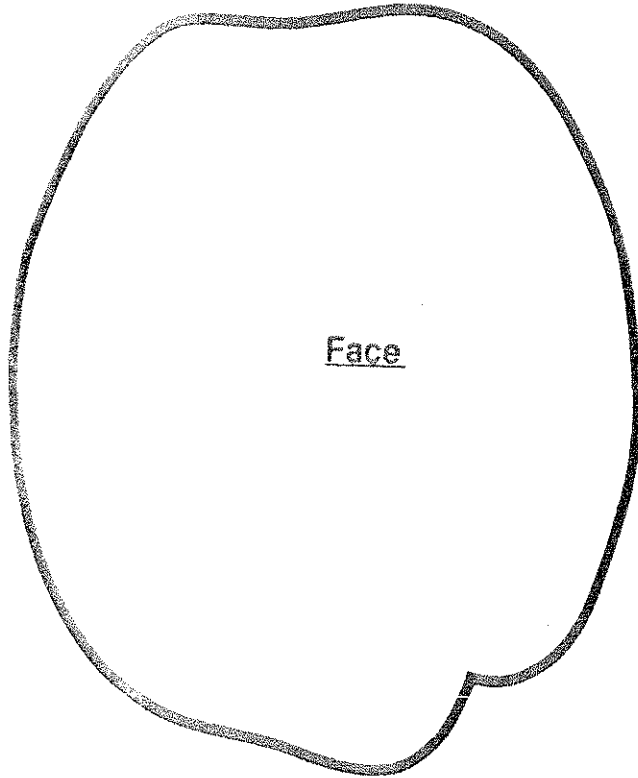
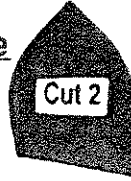
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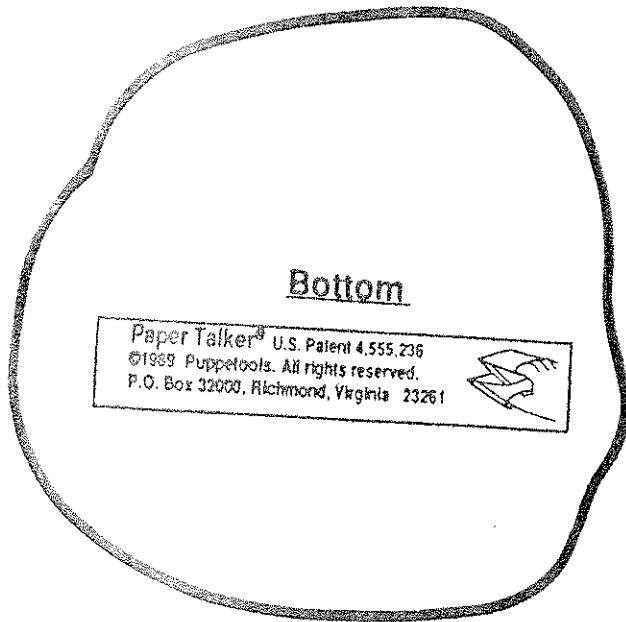
POTATO



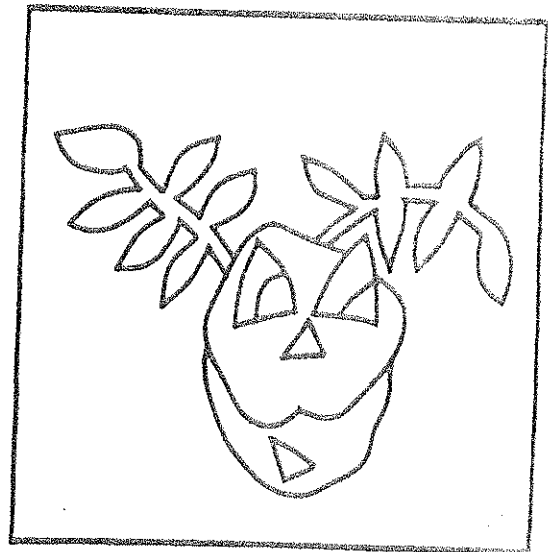
Inner Eye



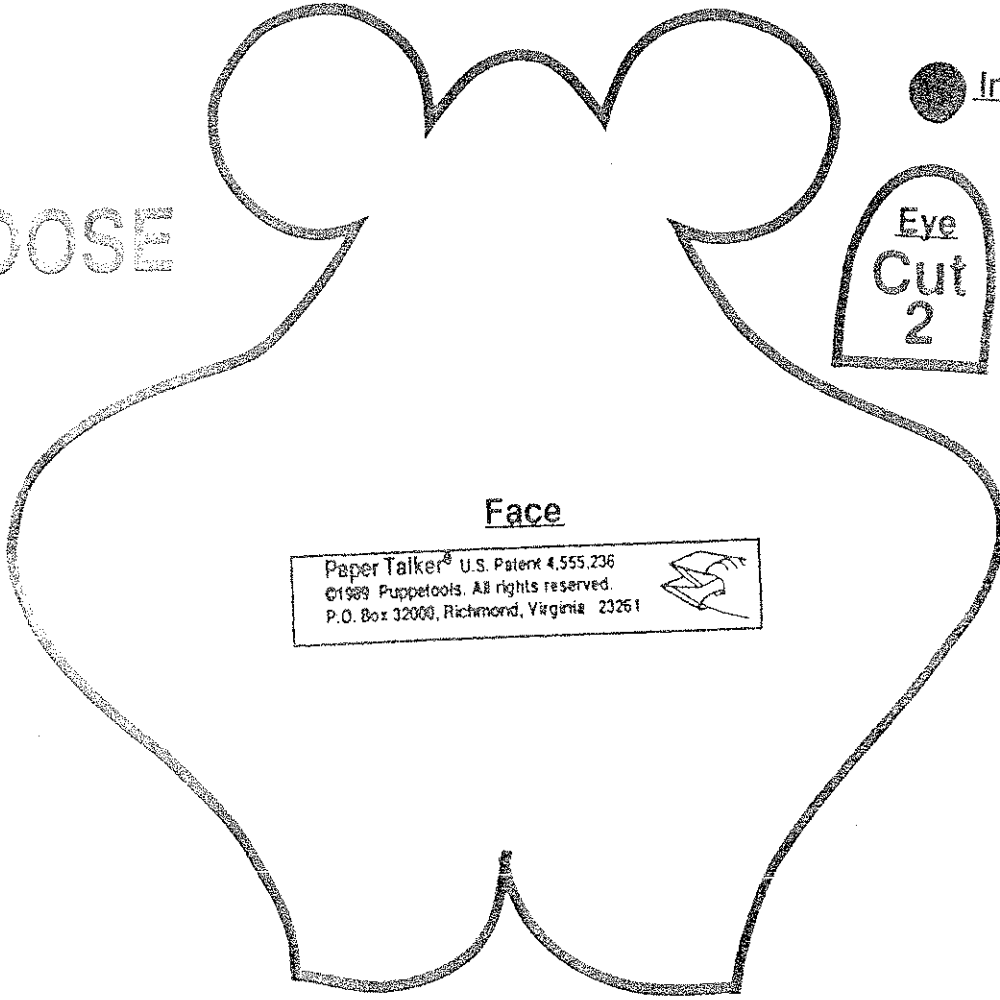
Make as many buds for the potato as you like.



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MOOSE

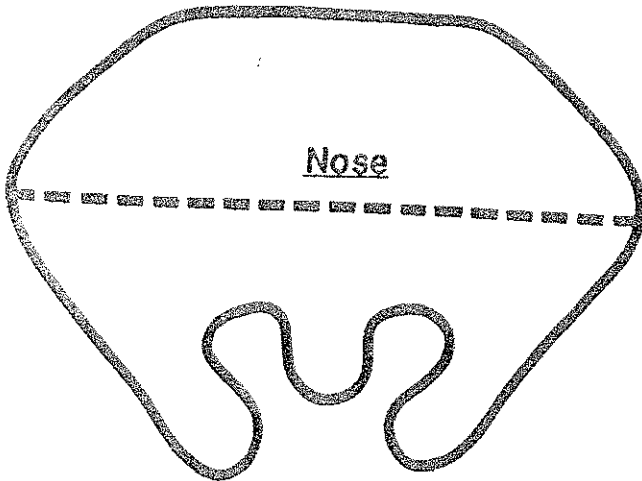


● Inner Eye

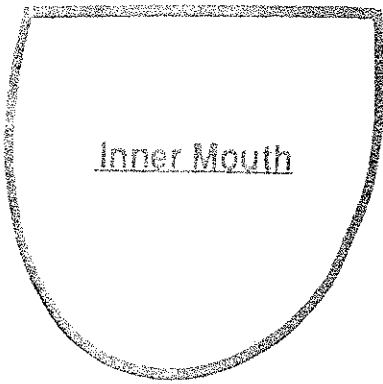


Face

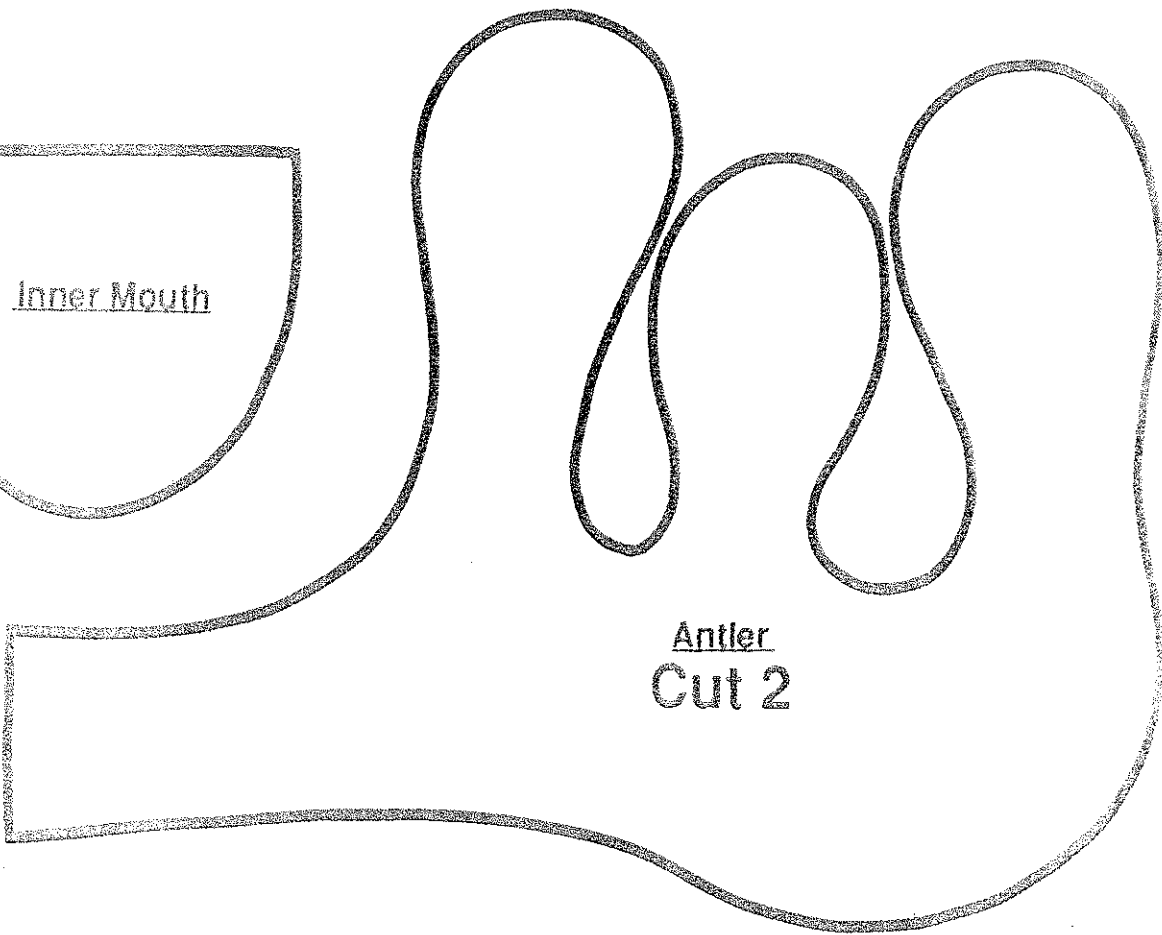
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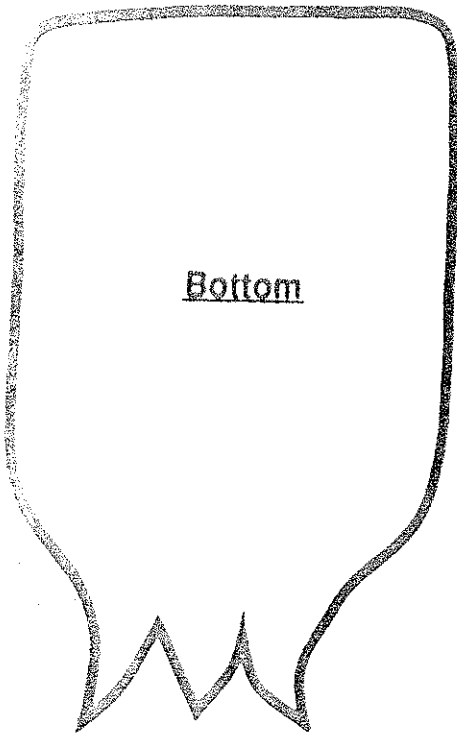
Nose



Inner Mouth

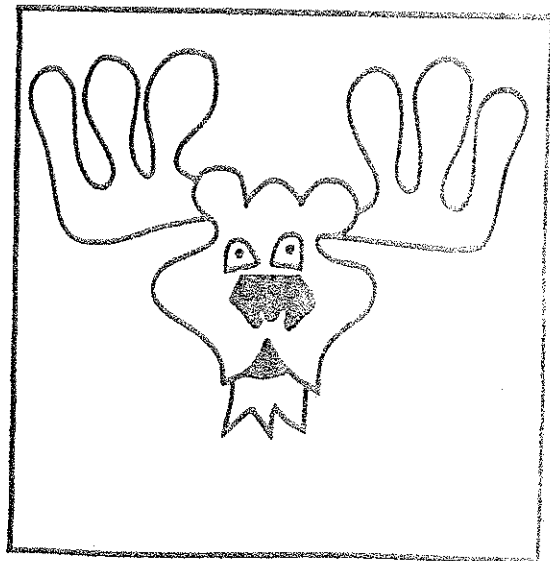


Antler
Cut 2



Bottom

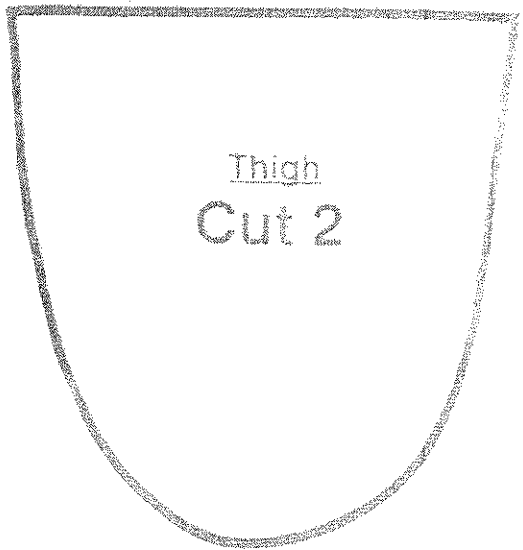
MOOSE PAGE 2



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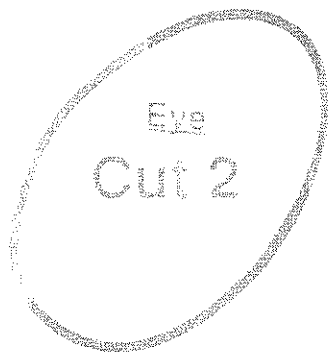


Body
Cut 2



Thigh
Cut 2

DUCK

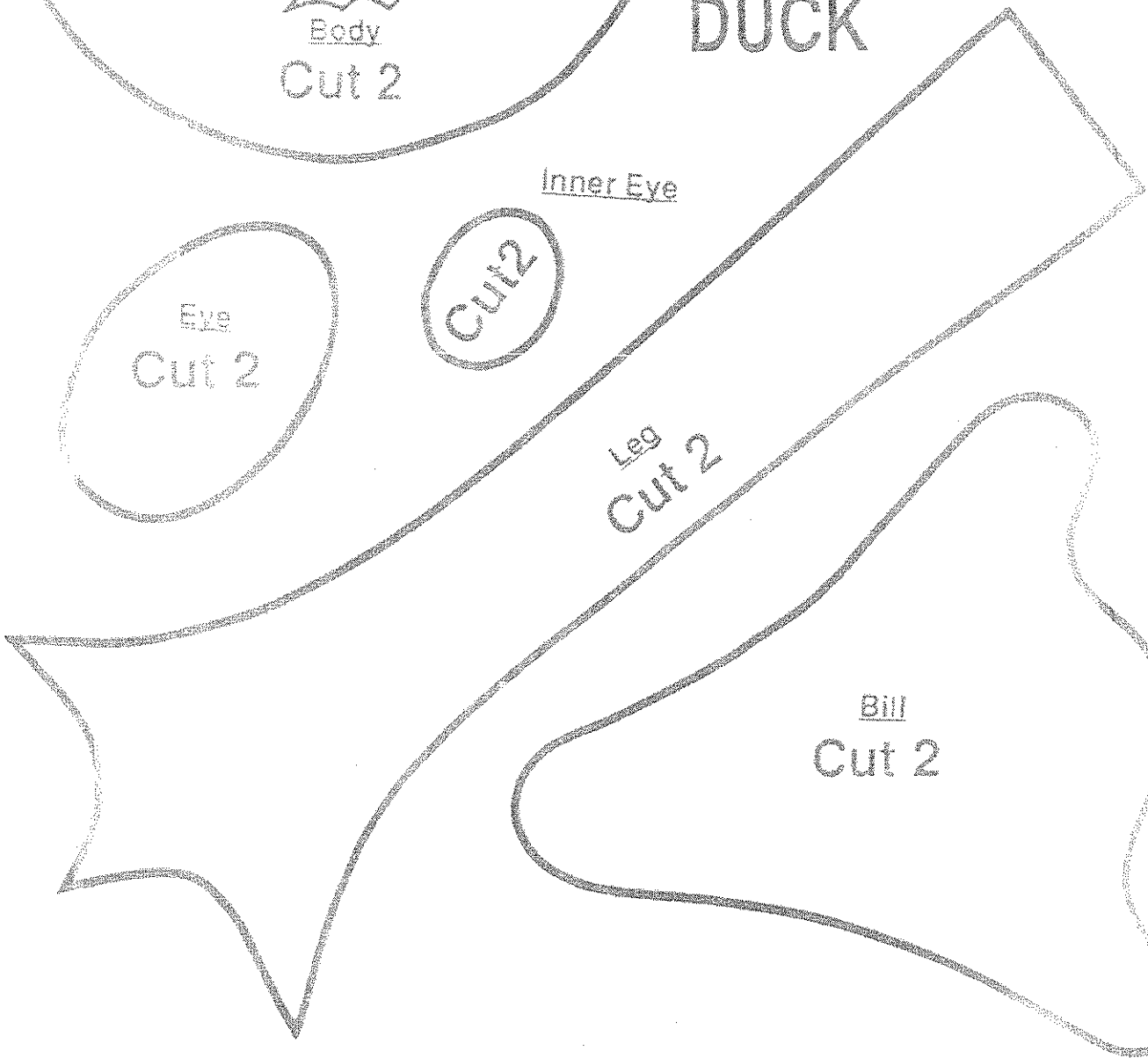


Eye
Cut 2



Inner Eye
Cut 2

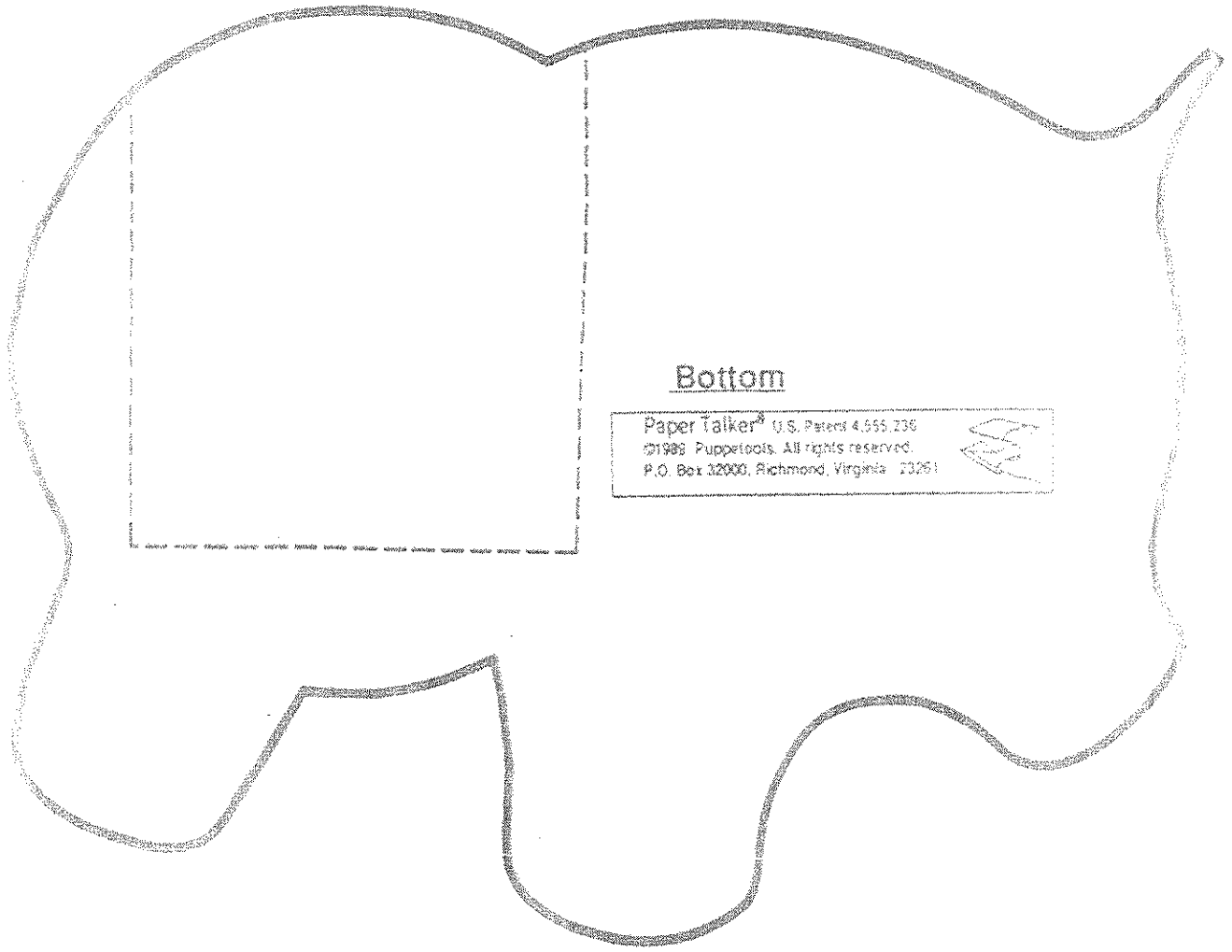
Inner Eye



Leg
Cut 2

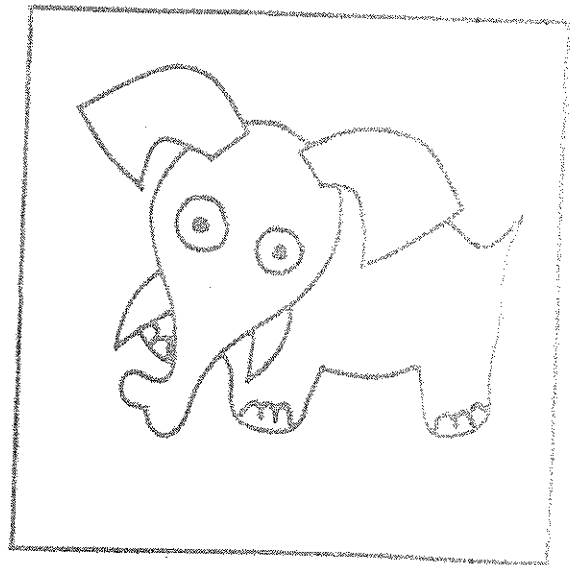
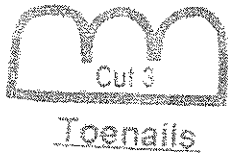
Bill
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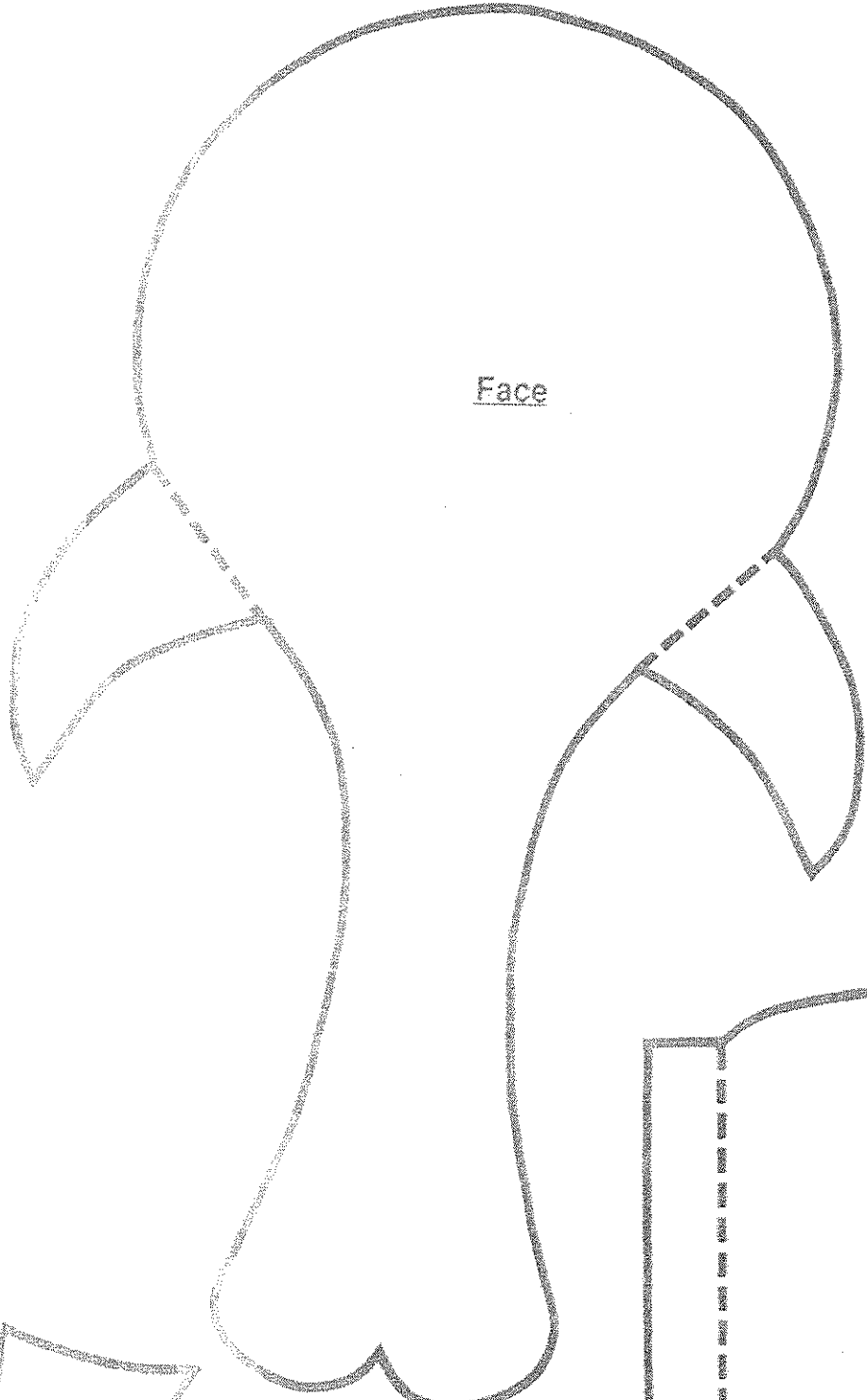




Bottom

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Face

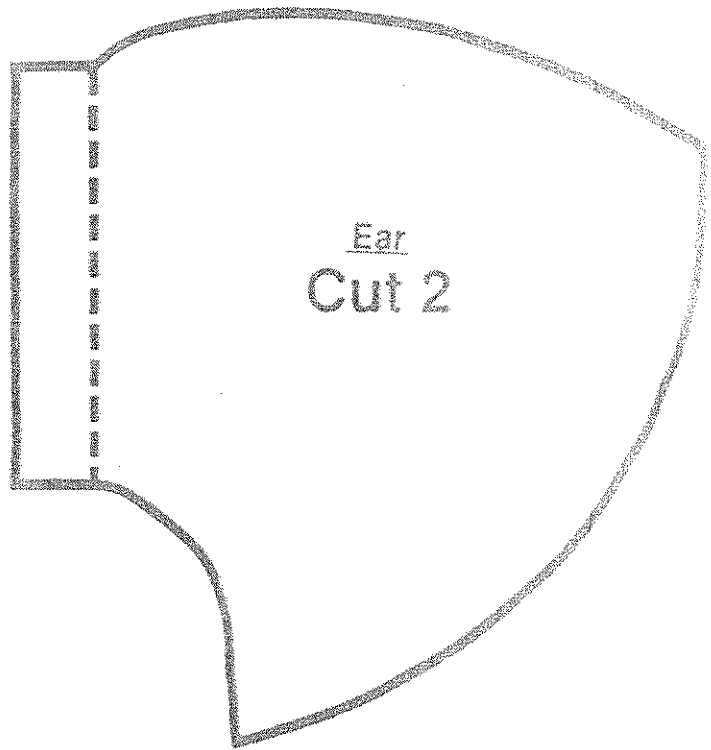


Eye
Cut 2

ELEPHANT

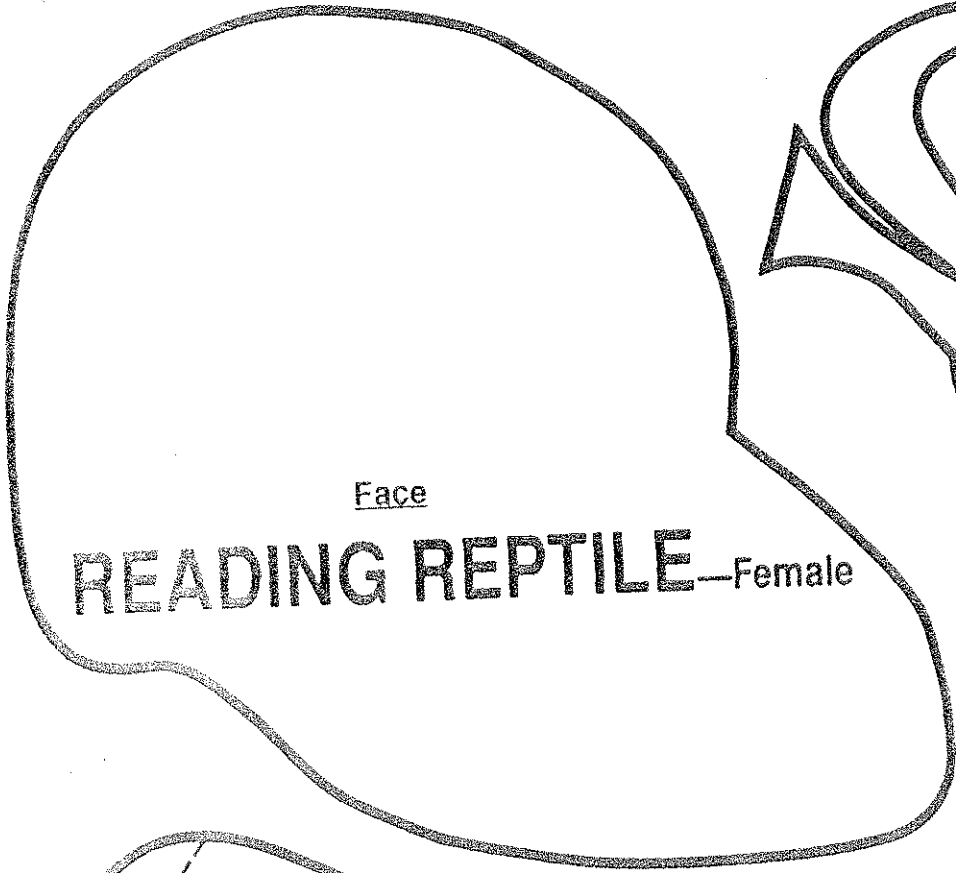


Tusk
Cut 2



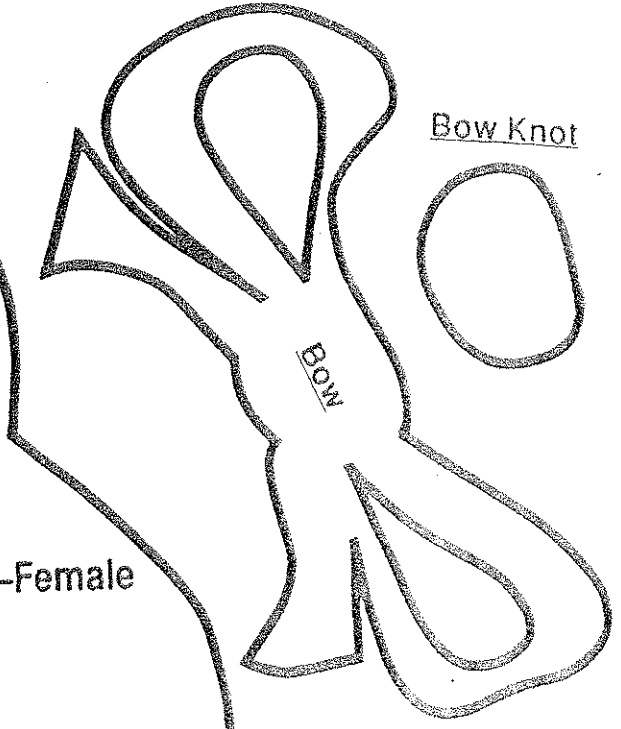
Ear
Cut 2





Face

READING REPTILE—Female

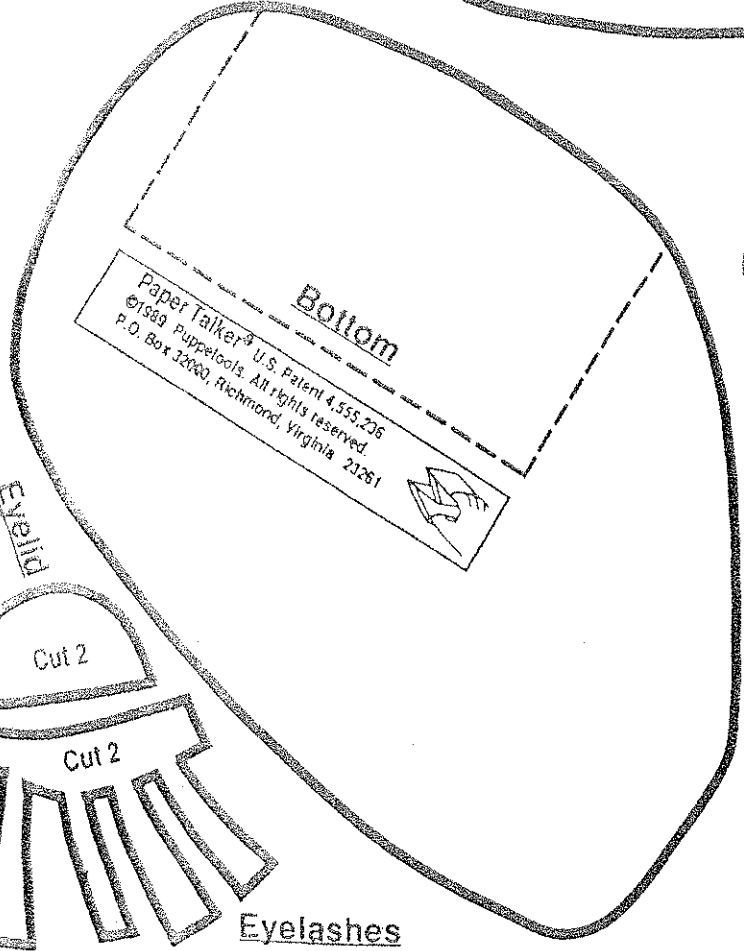


Bow Knot

Bow

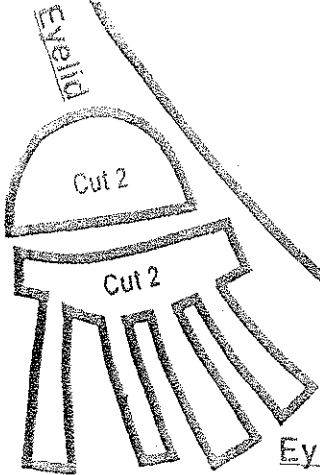
Nostril

Cut 2



Bottom

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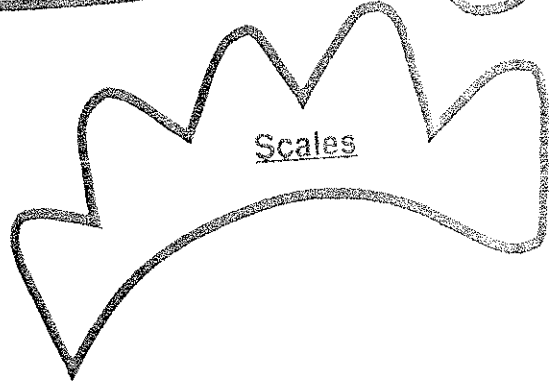


Eyelid

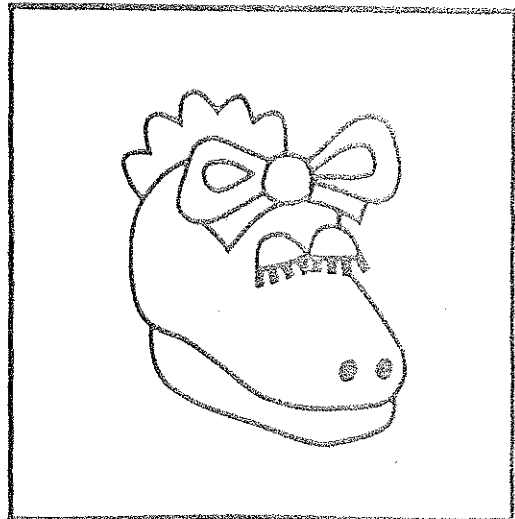
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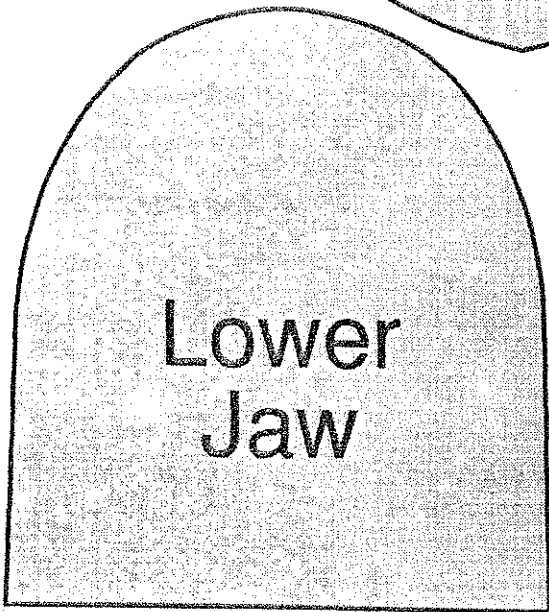
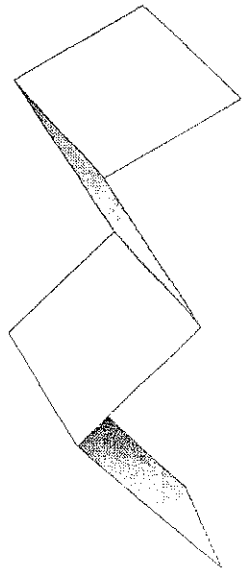
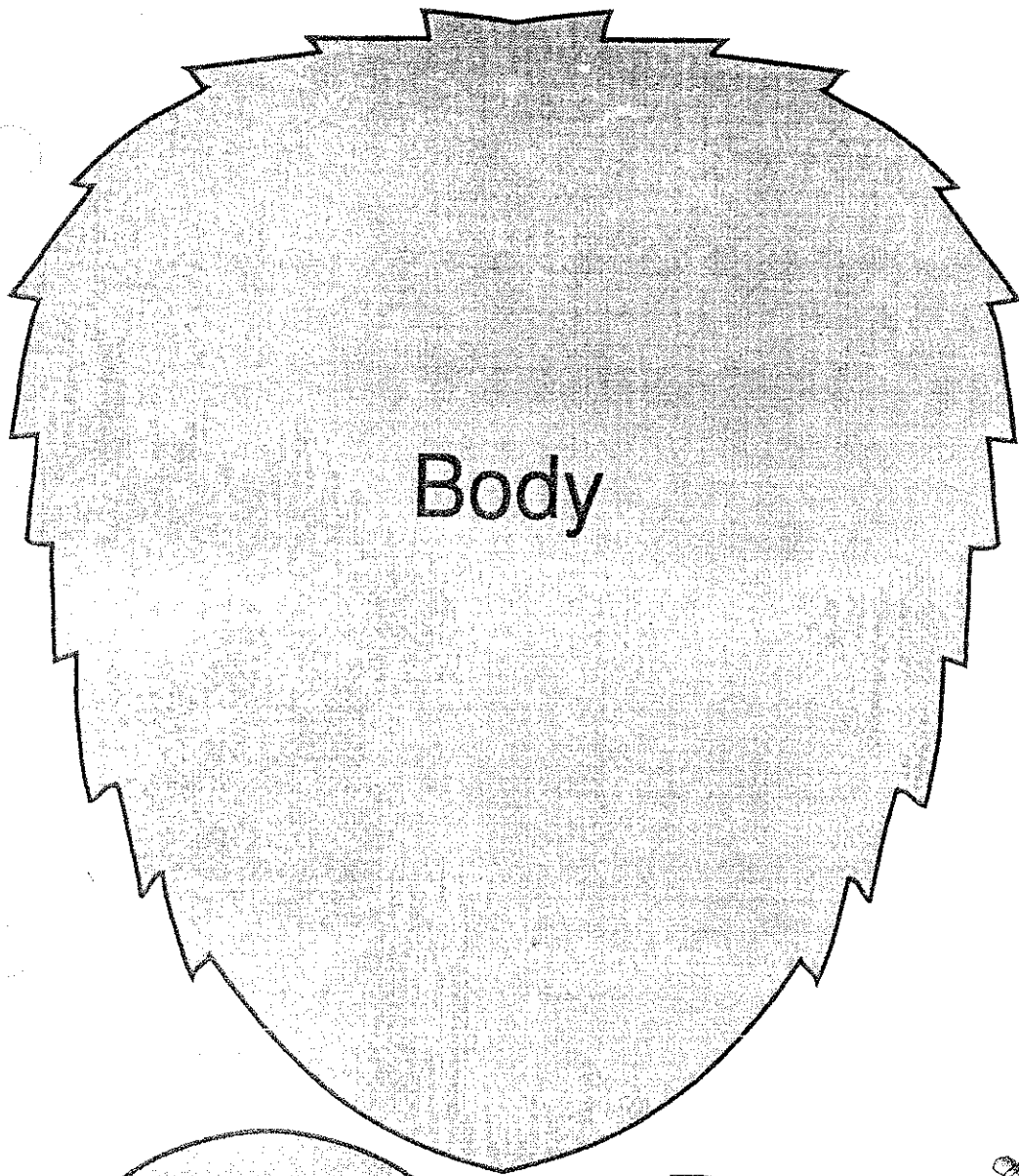
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Eyelashes

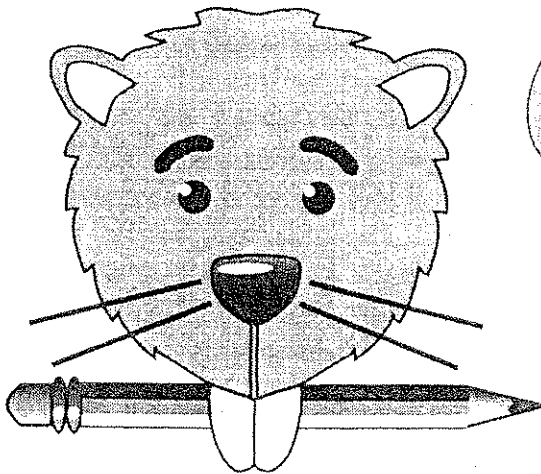


Scales





Beaver

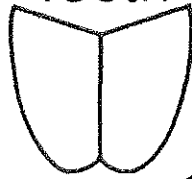


Nose

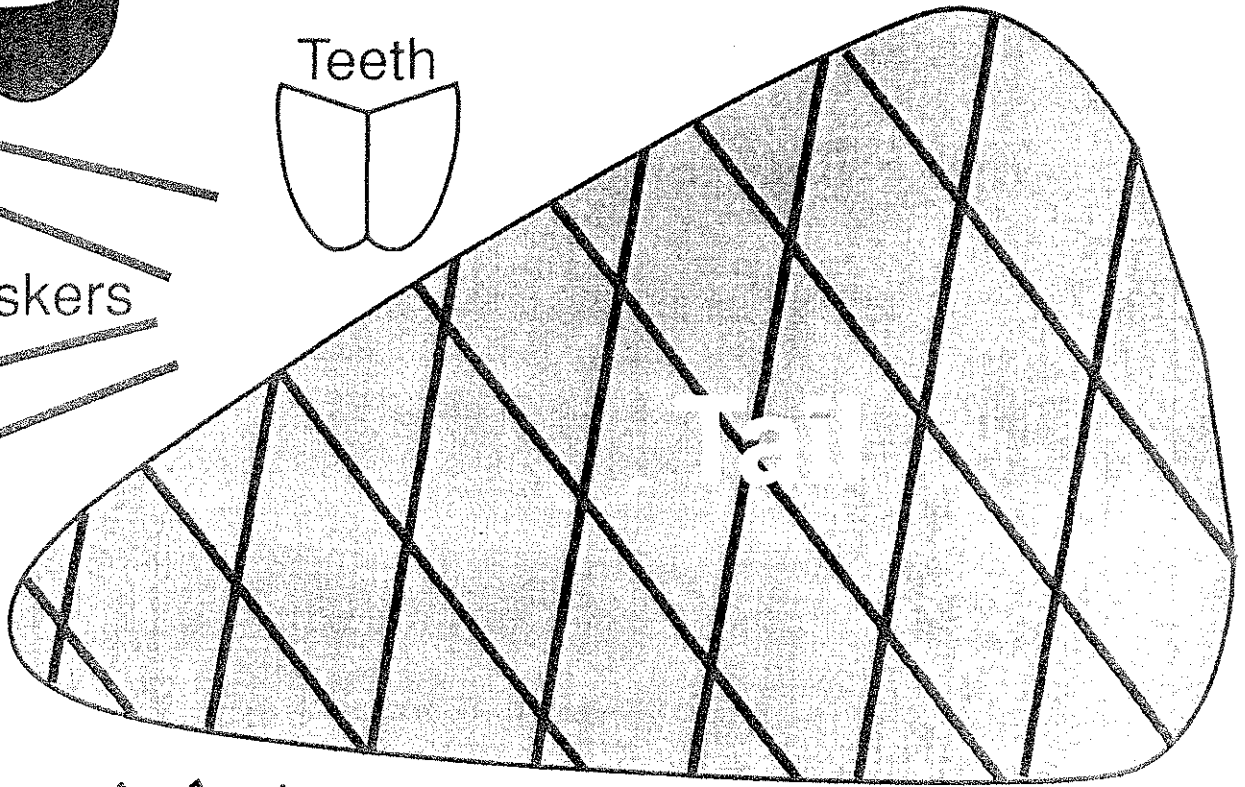


Eyes

Teeth

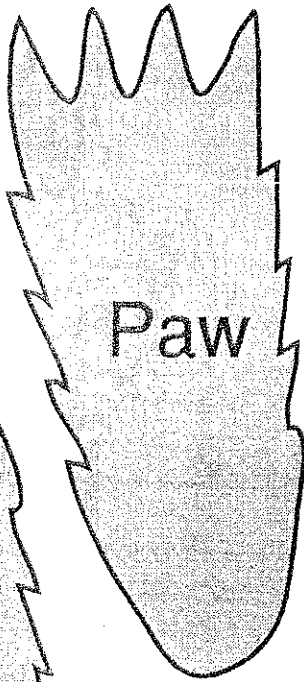


Whiskers

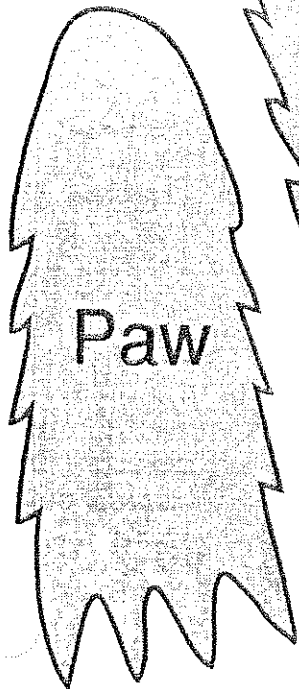


Tail

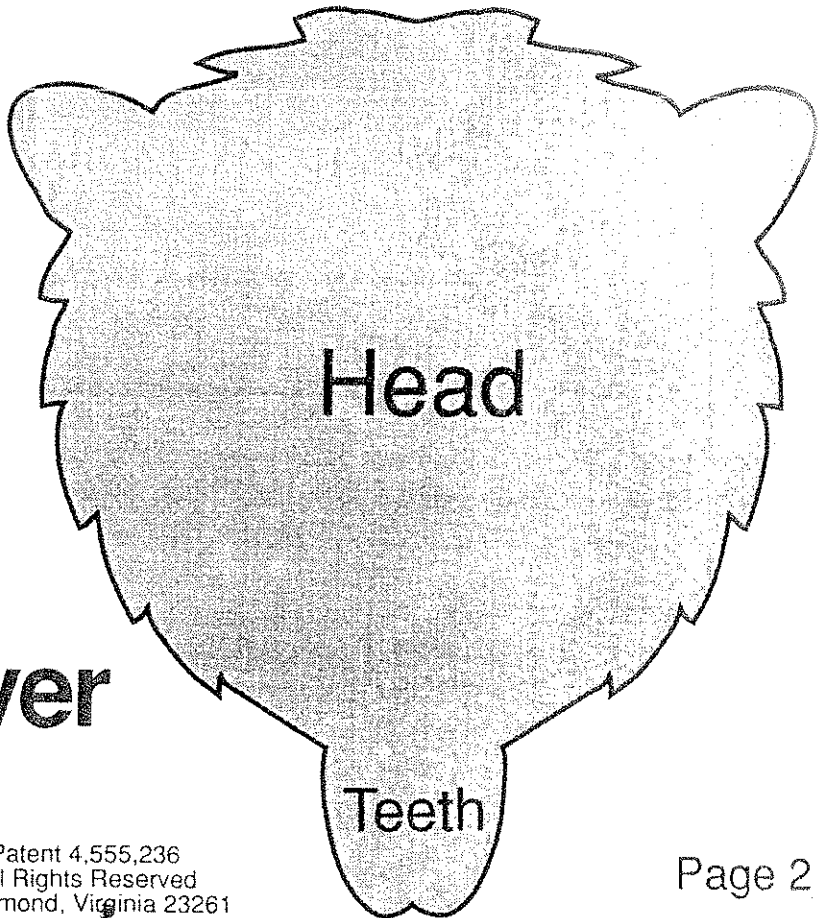
Inner Ears



Paw



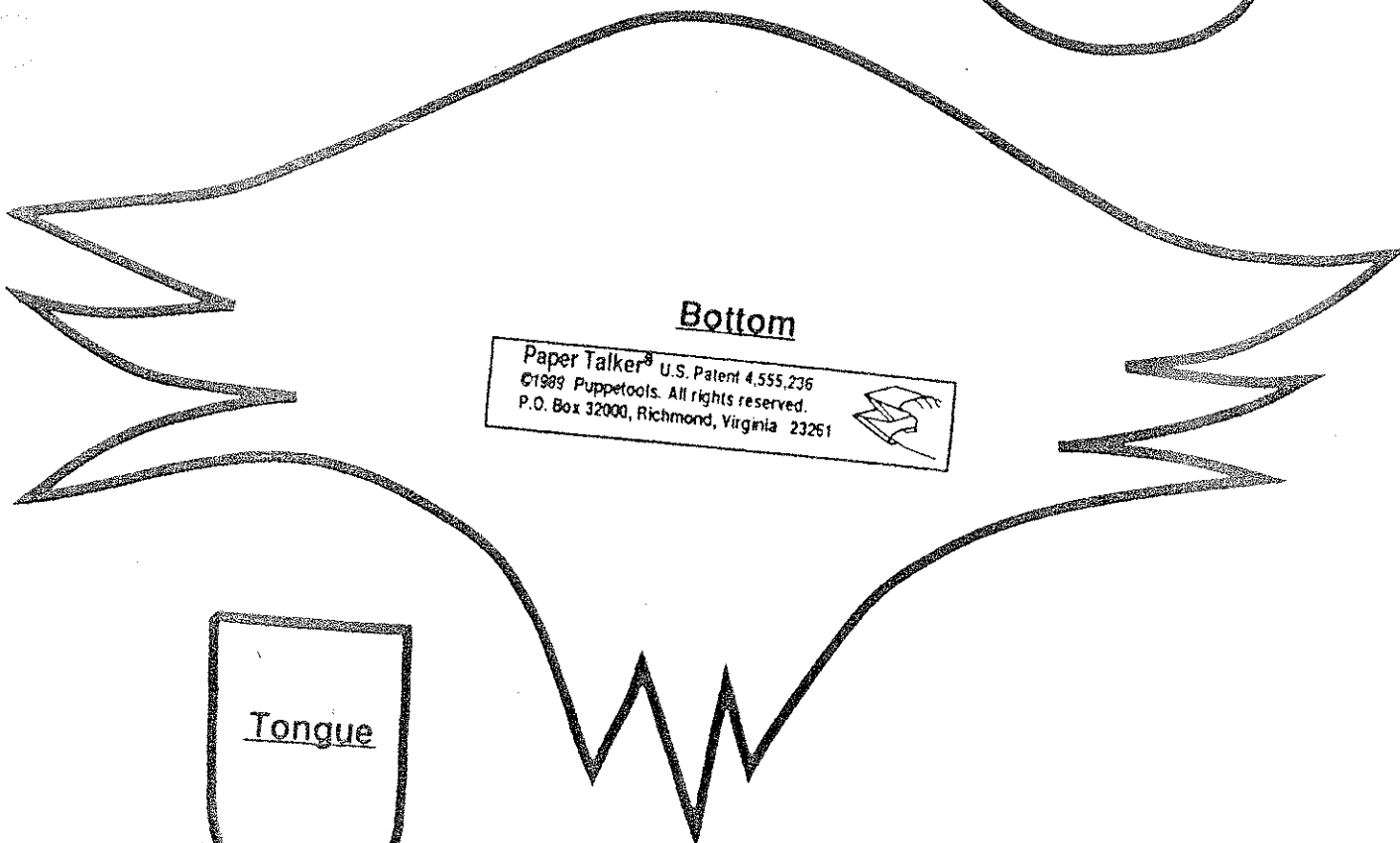
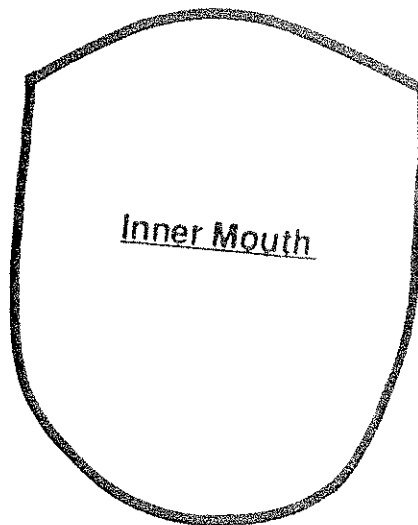
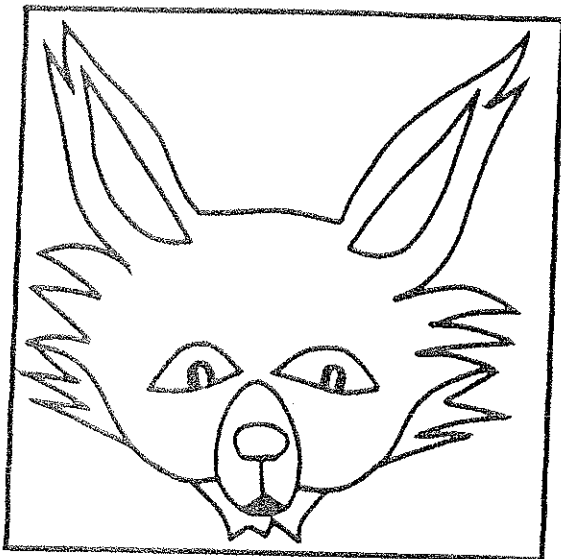
Paw



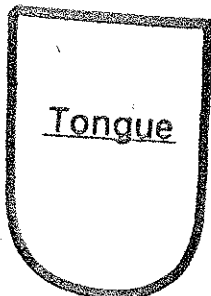
Head

Teeth

Beaver



Bottom
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FOX

Inner Ear

Face

Nose

Snout

Eye
Cut 2

Inner Eye

Eye Center

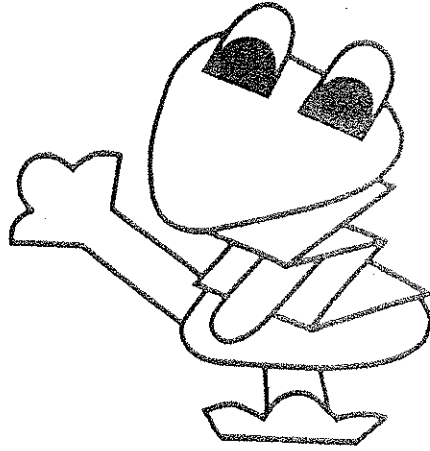
Cut 2

Cut 2



"VICTOR"

Body
Cut 2



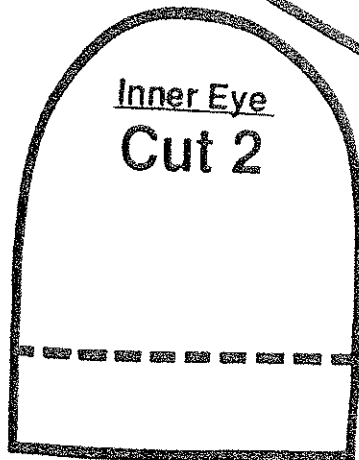
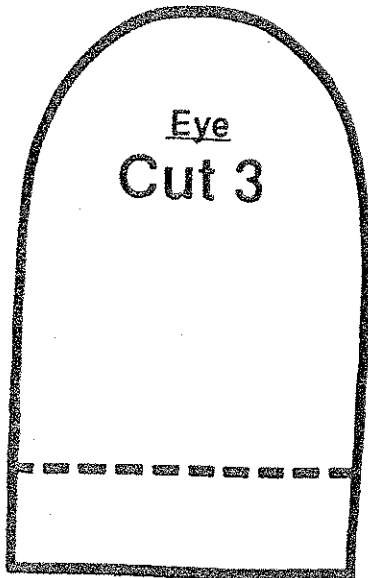
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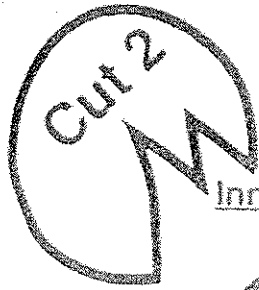
Leg
Cut 2

Eye
Cut 3

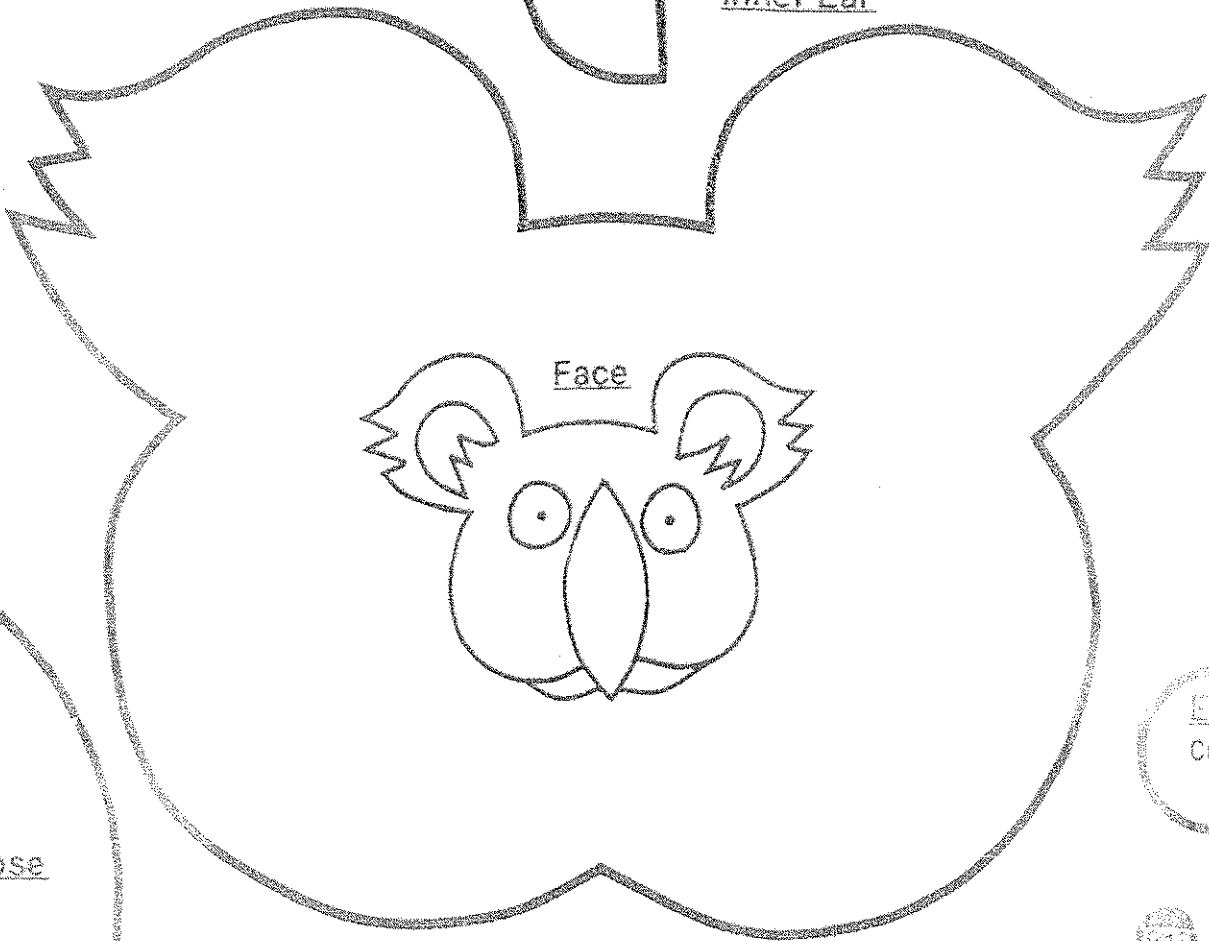
Inner Eye
Cut 2



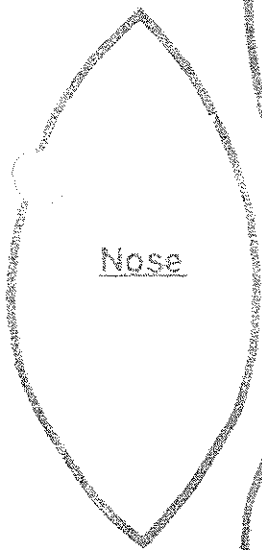
KOALA



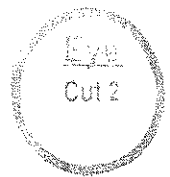
Inner Ear



Face



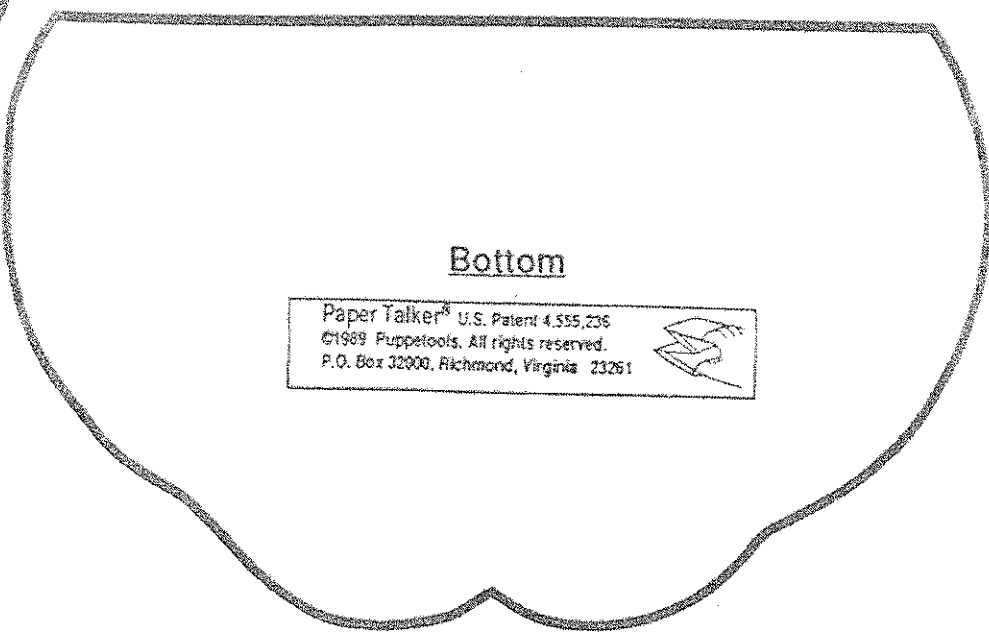
Nose



Eye
Cut 2



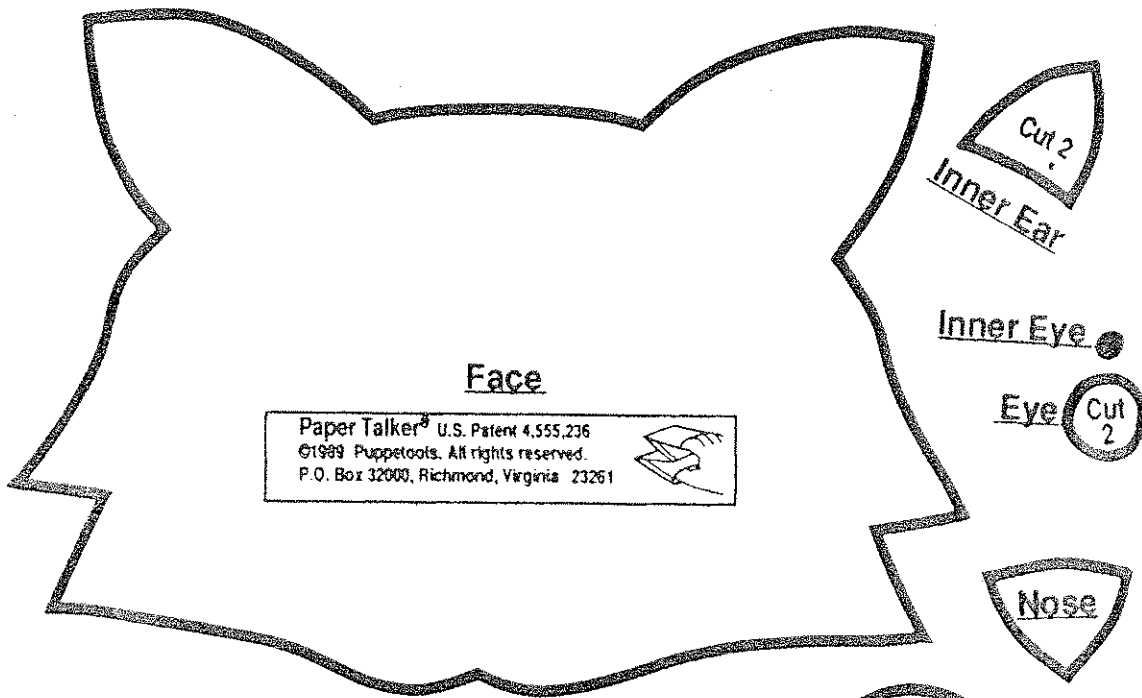
Inner Eye



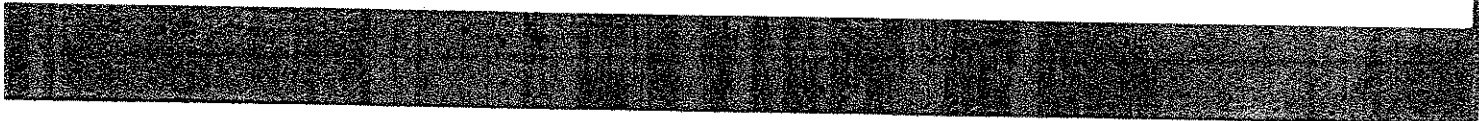
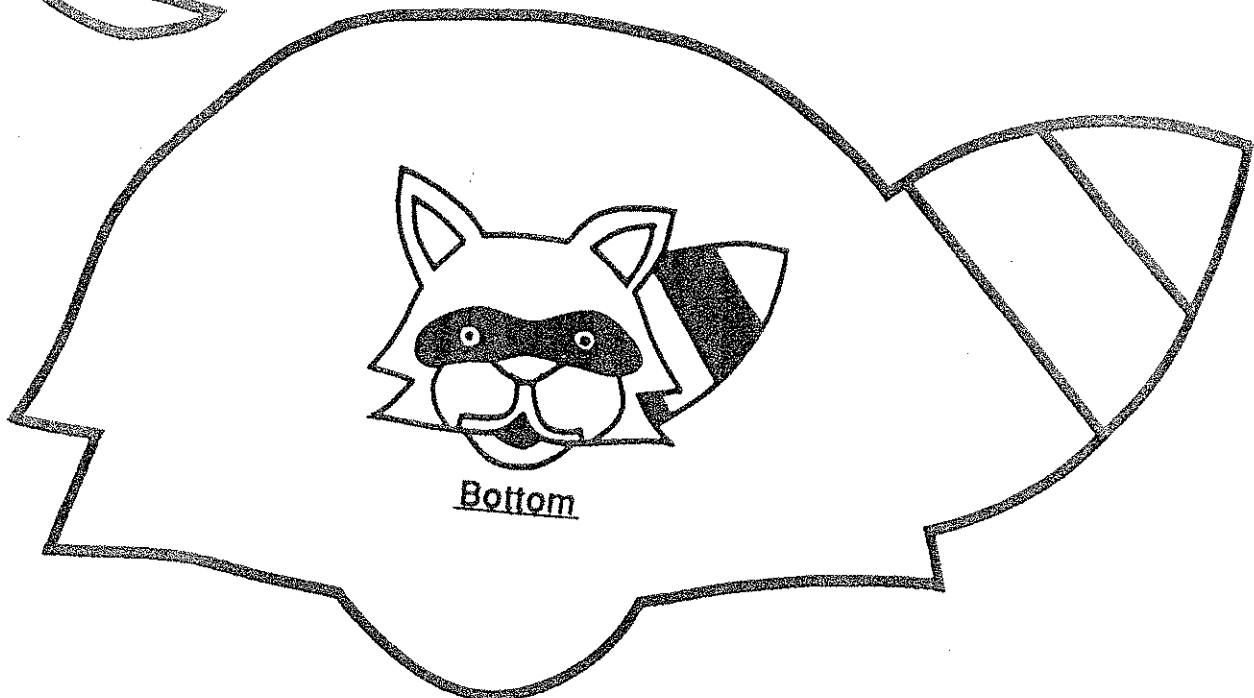
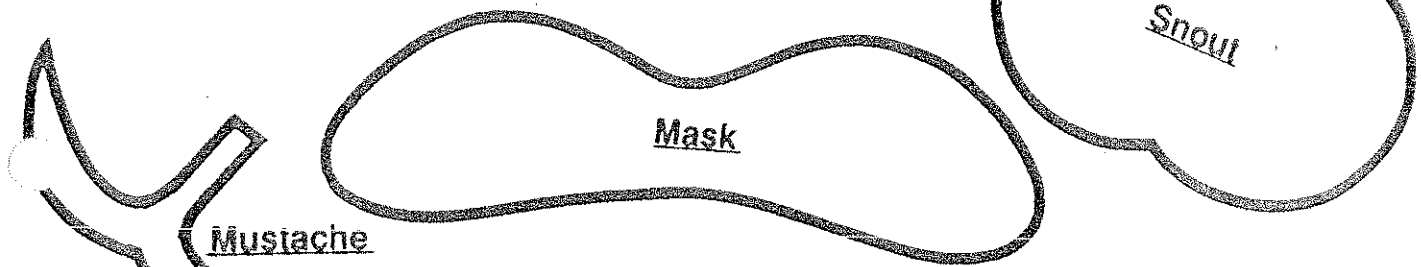
Bottom

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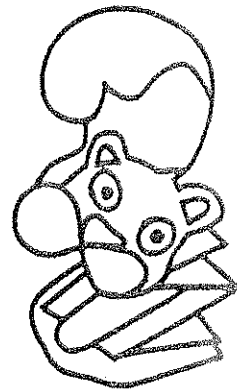
RACCOON

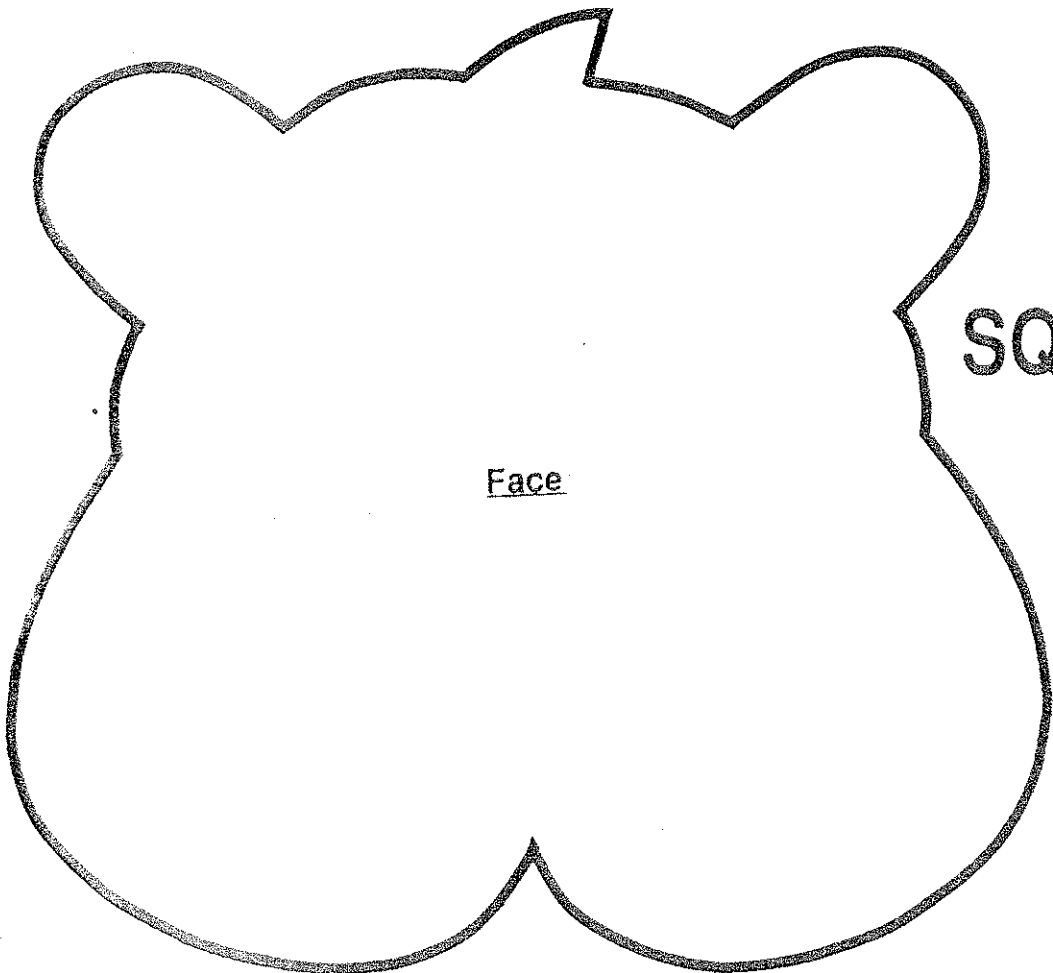


Tongue

Tail

SQUIRREL
PAGE 2



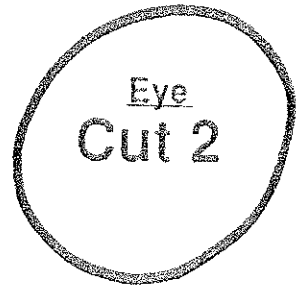


Face

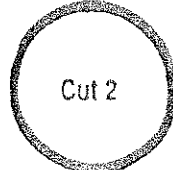


Inner Ear
Cut 2

SQUIRREL



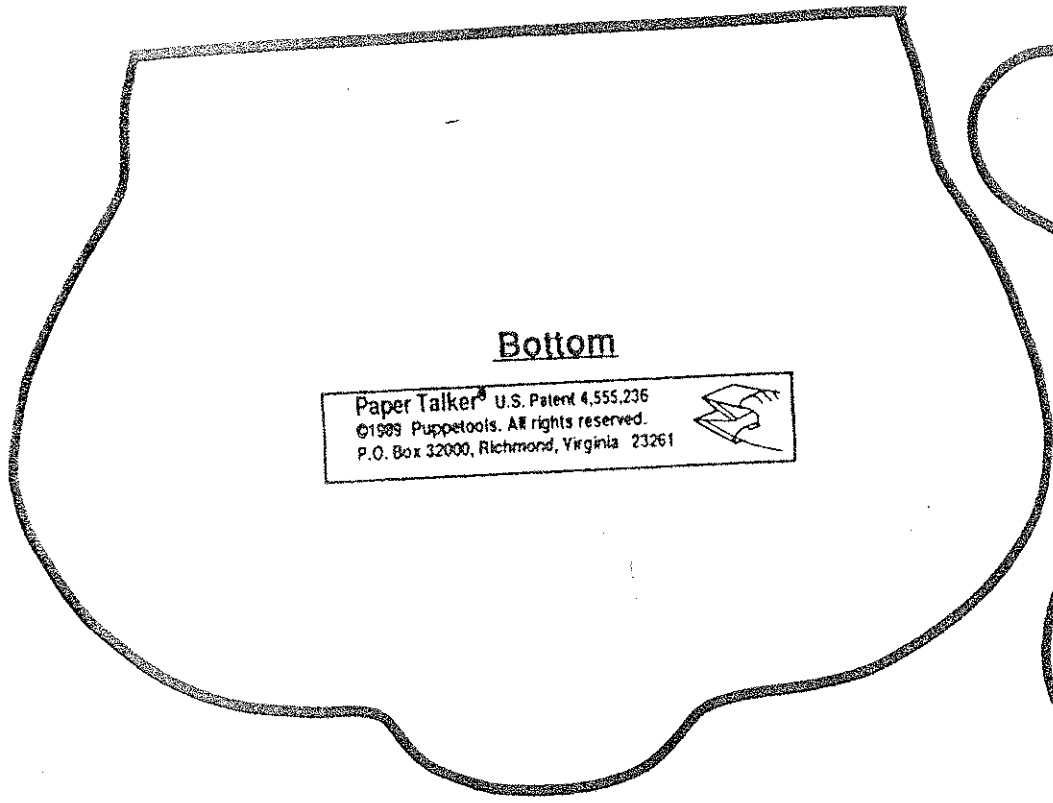
Eye
Cut 2



Cut 2

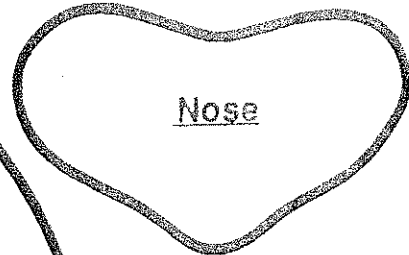


Inner Eye

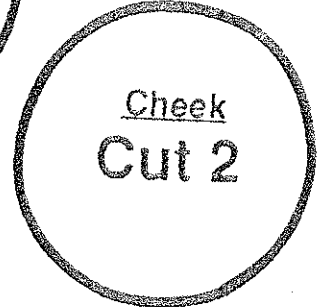


Bottom

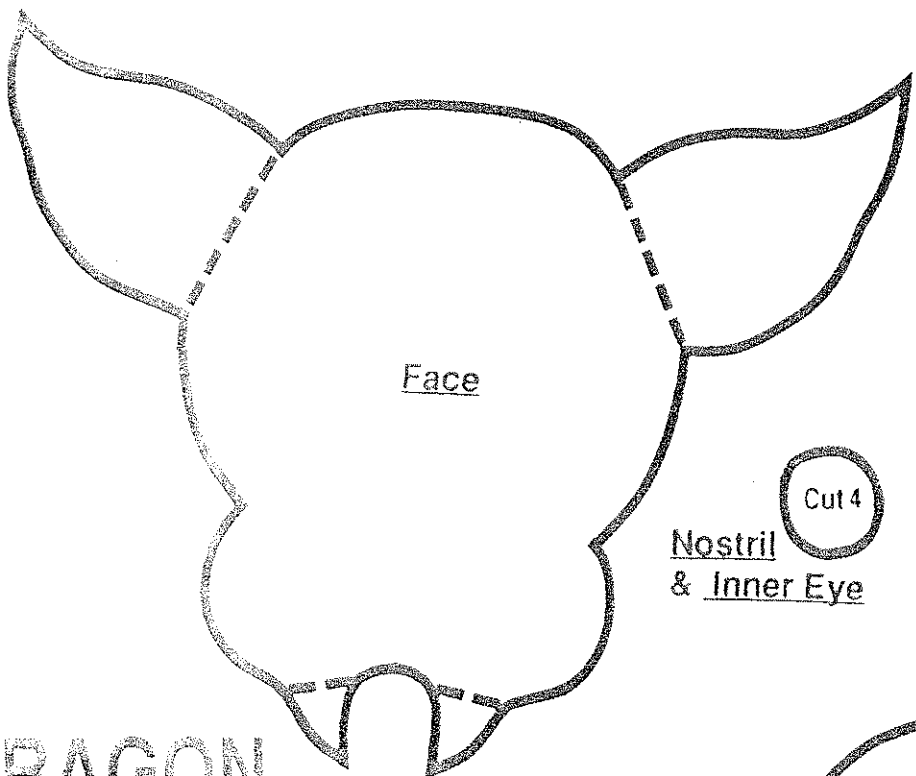
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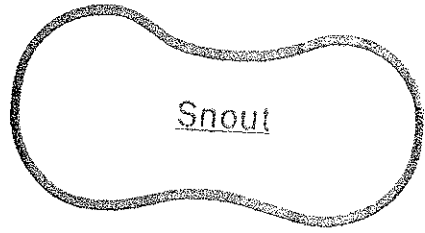
Nose



Cheek
Cut 2



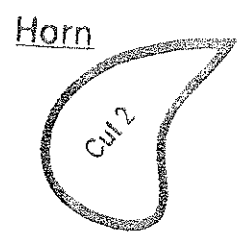
Face



Snout



Nostril & Inner Eye



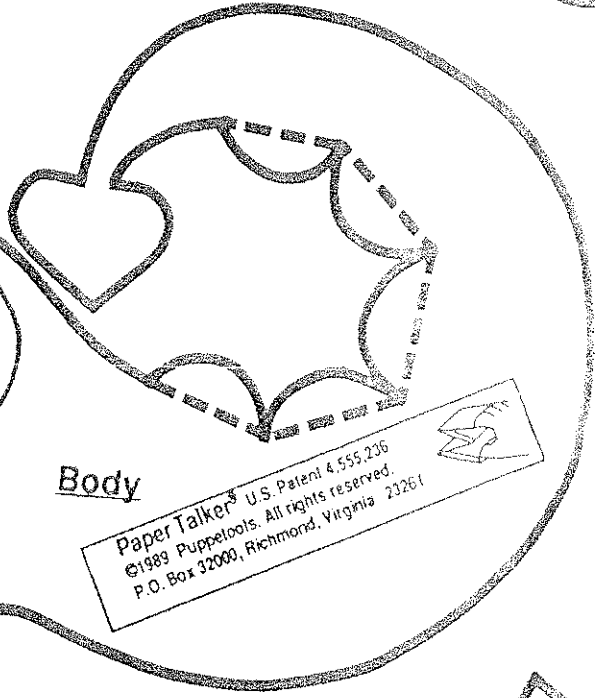
Horn

Cut 2



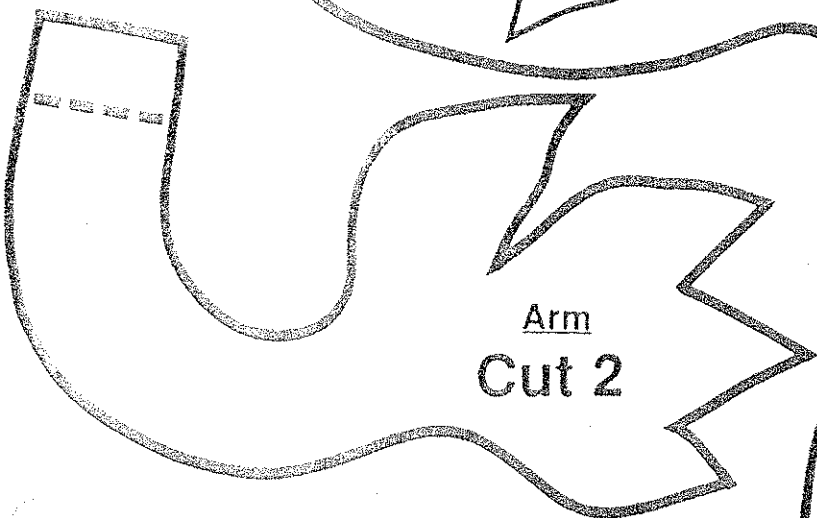
Eye
Cut 2

DRAGON

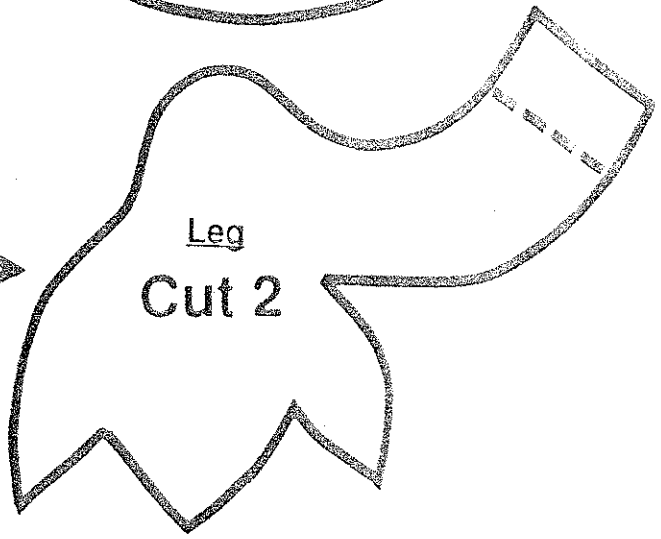


Body

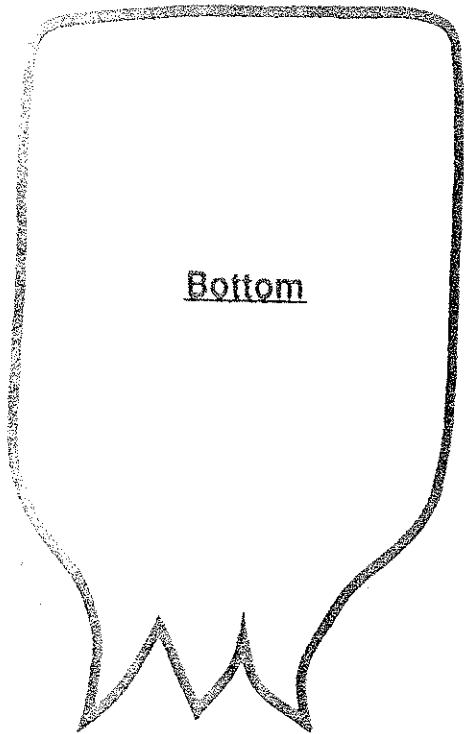
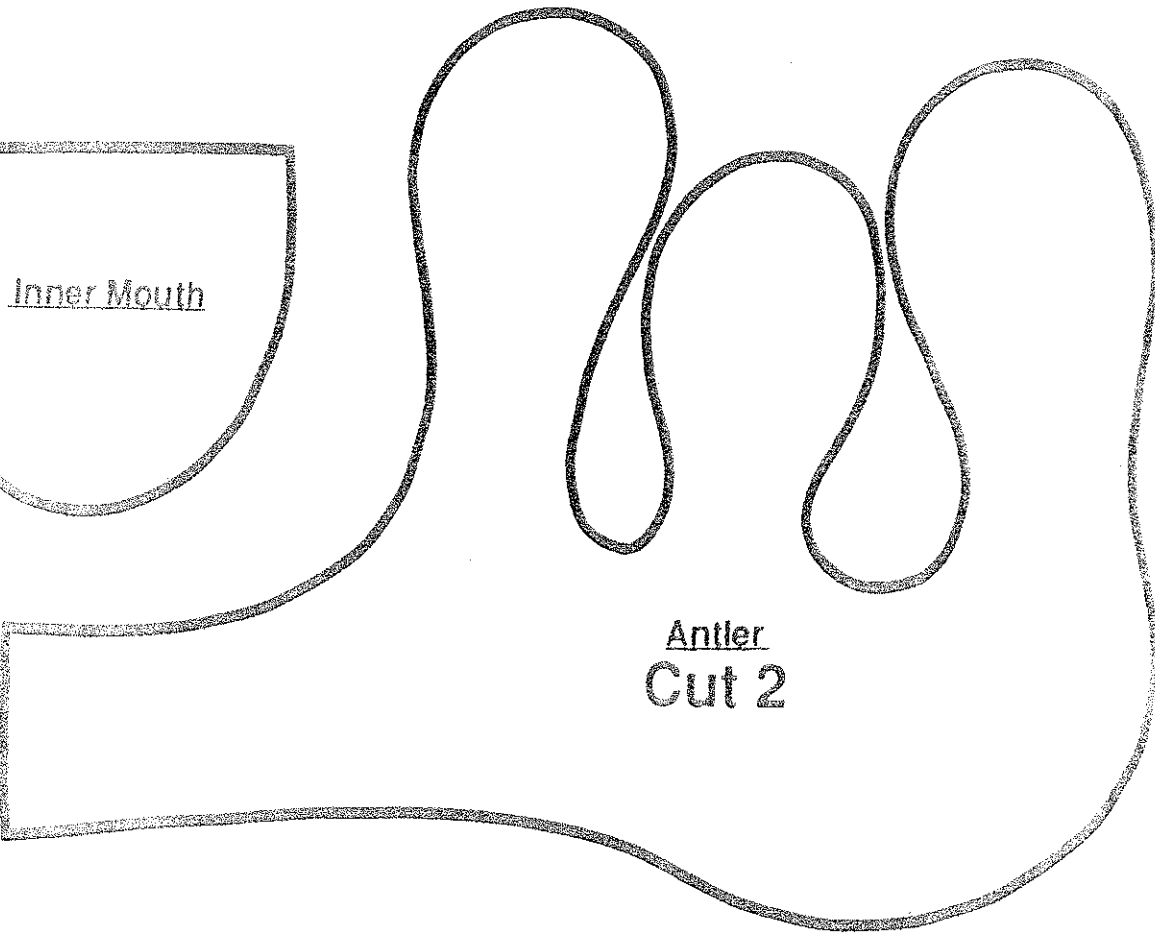
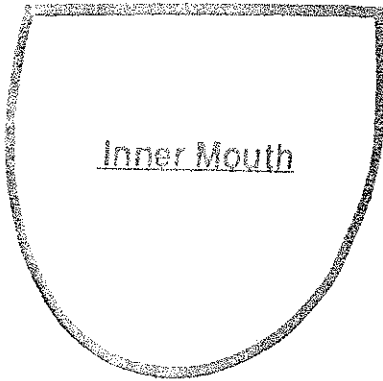
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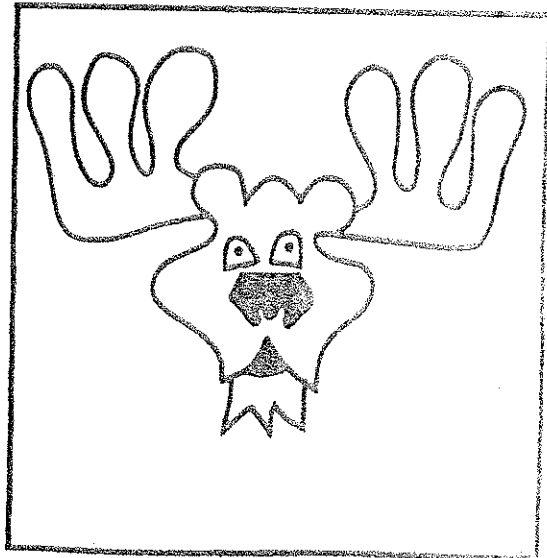
Arm
Cut 2



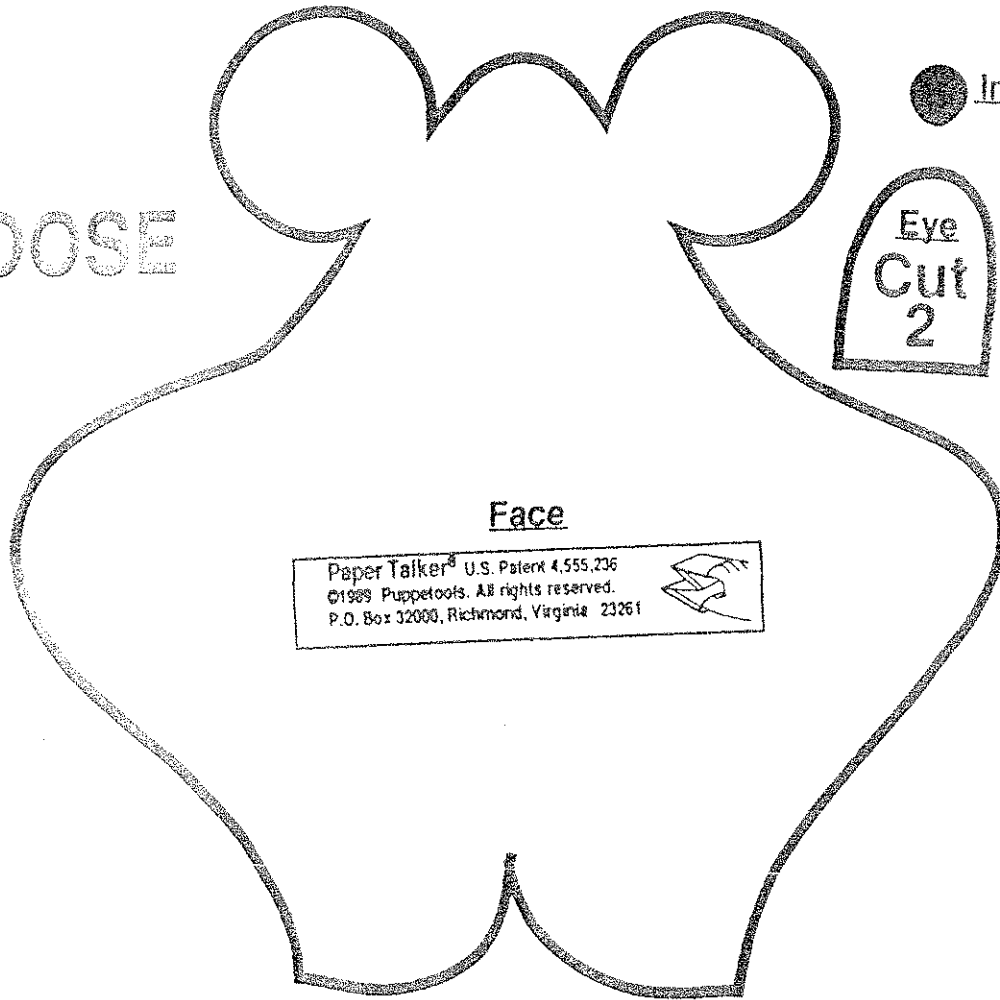
Leg
Cut 2



MOOSE PAGE 2



MOOSE

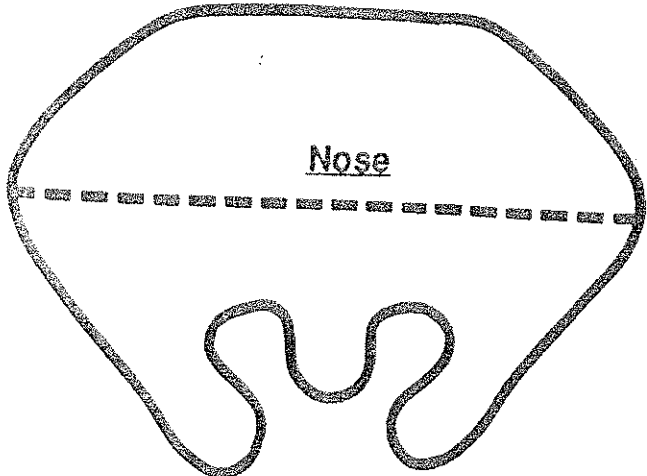


● Inner Eye

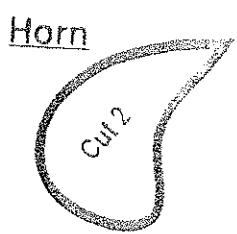
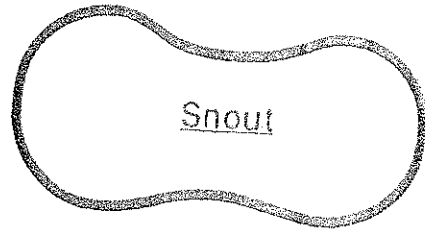
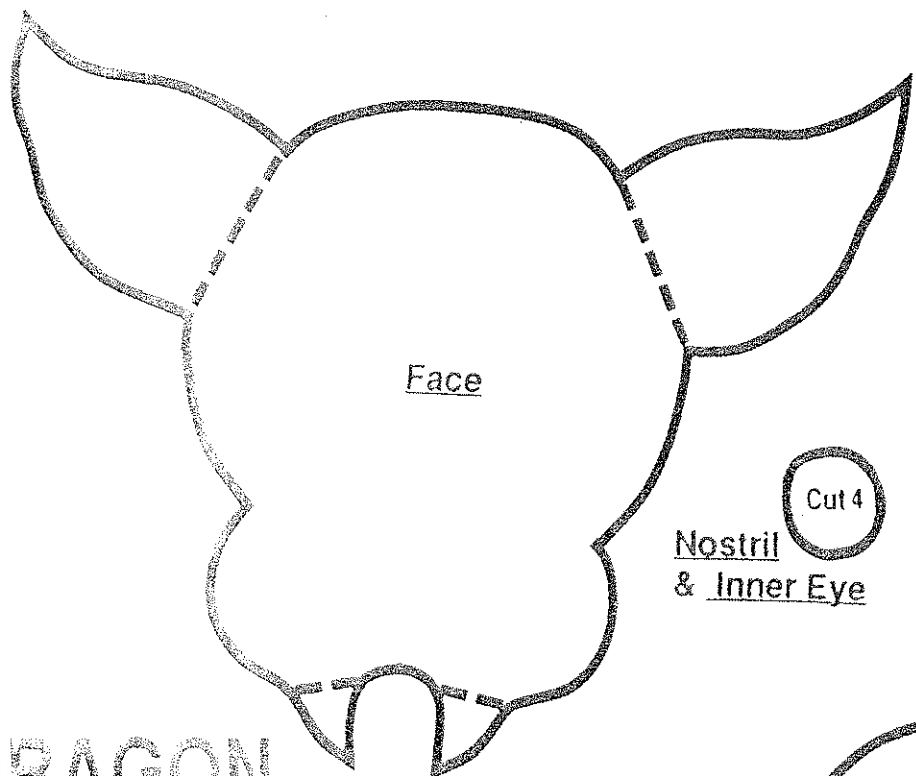


Face

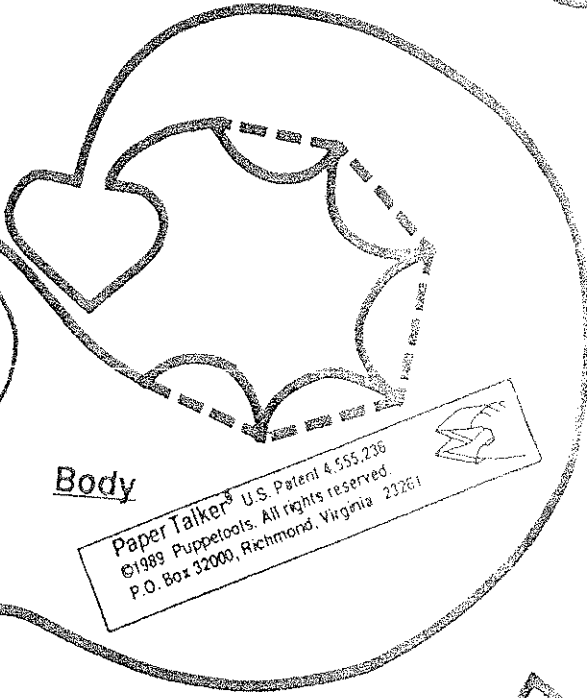
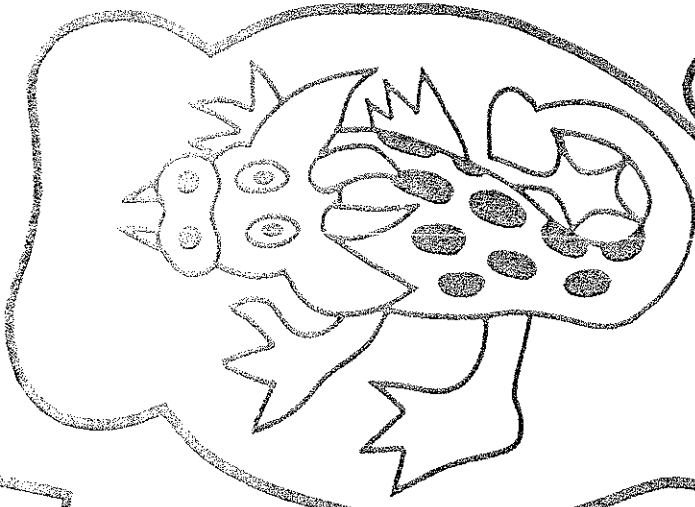
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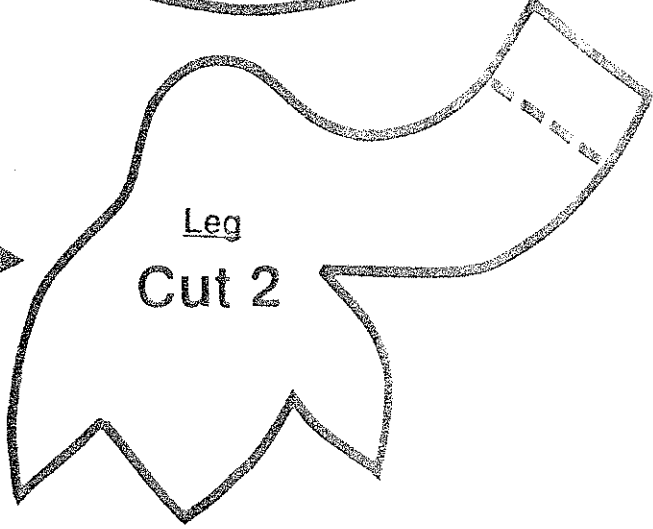
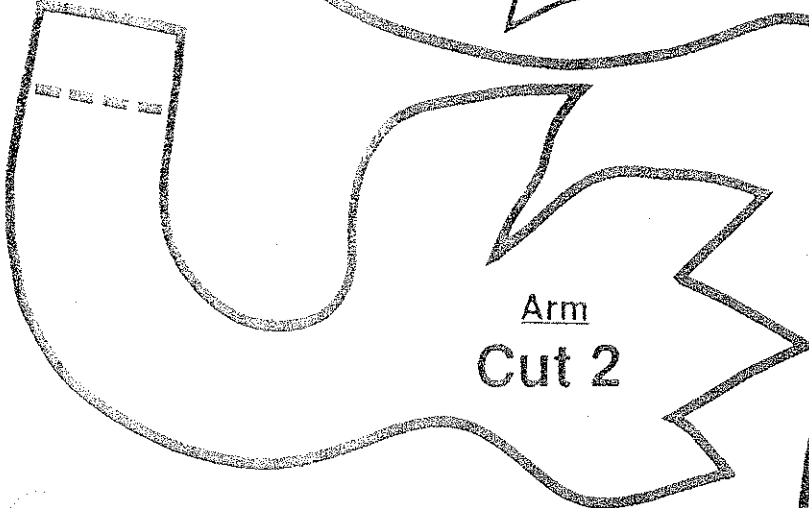
Nose

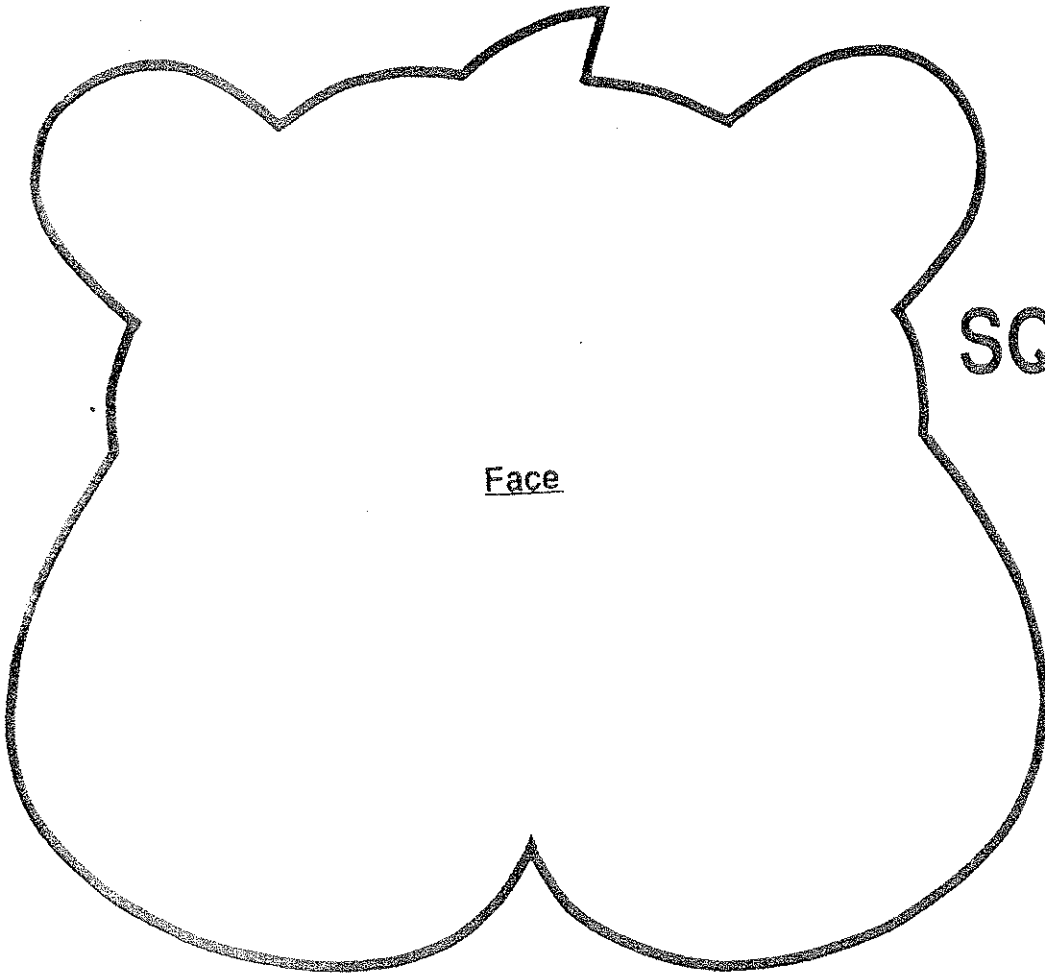


DRAGON



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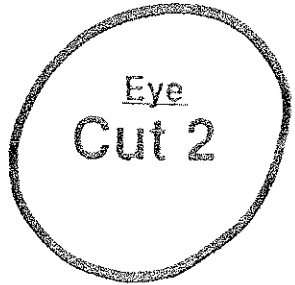


Face

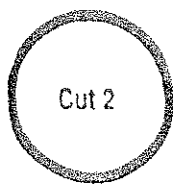


Inner Ear
Cut 2

SQUIRREL



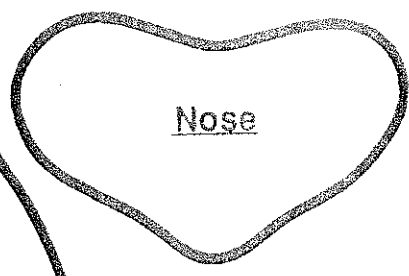
Eye
Cut 2



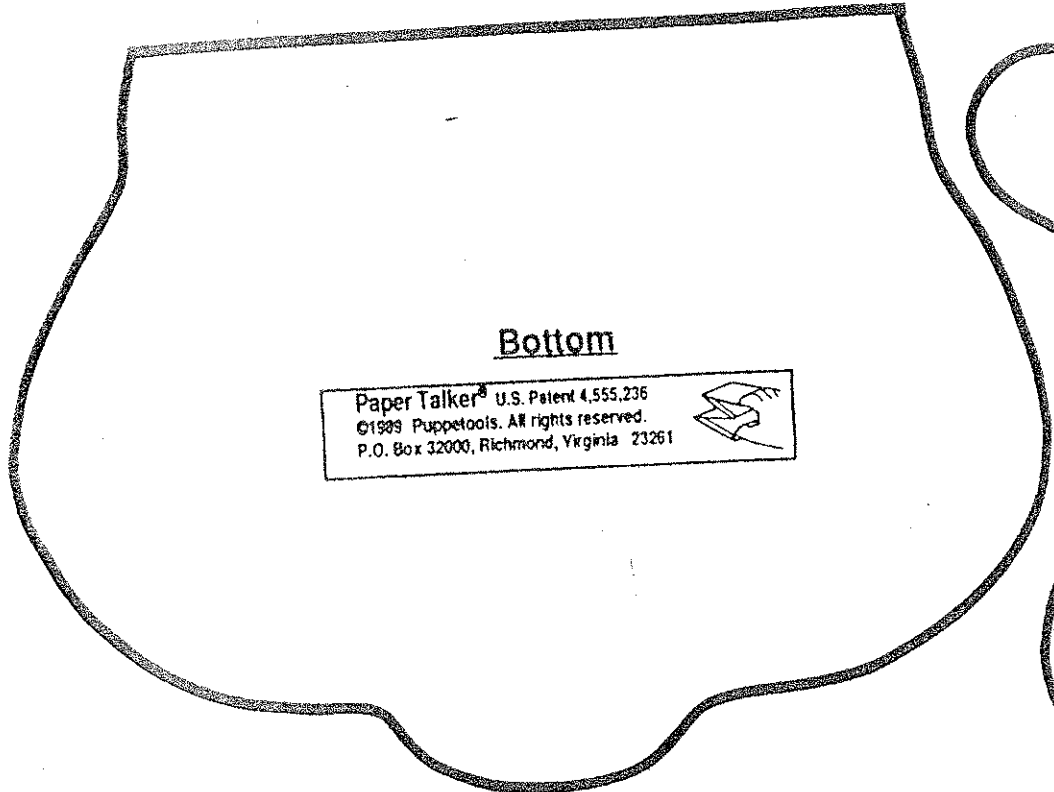
Cut 2



Inner Eye

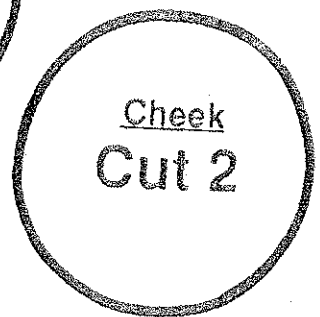


Nose



Bottom

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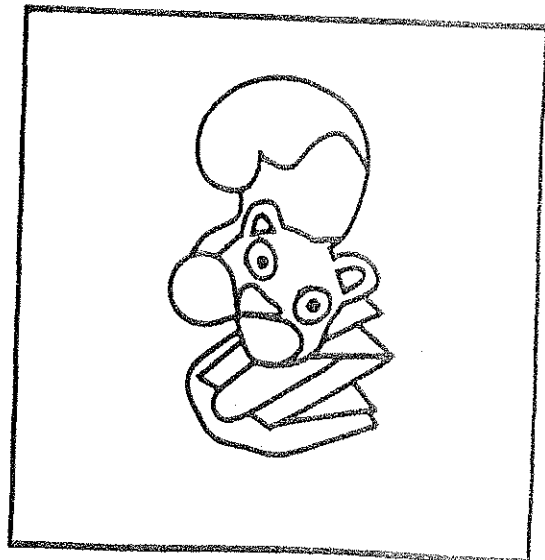


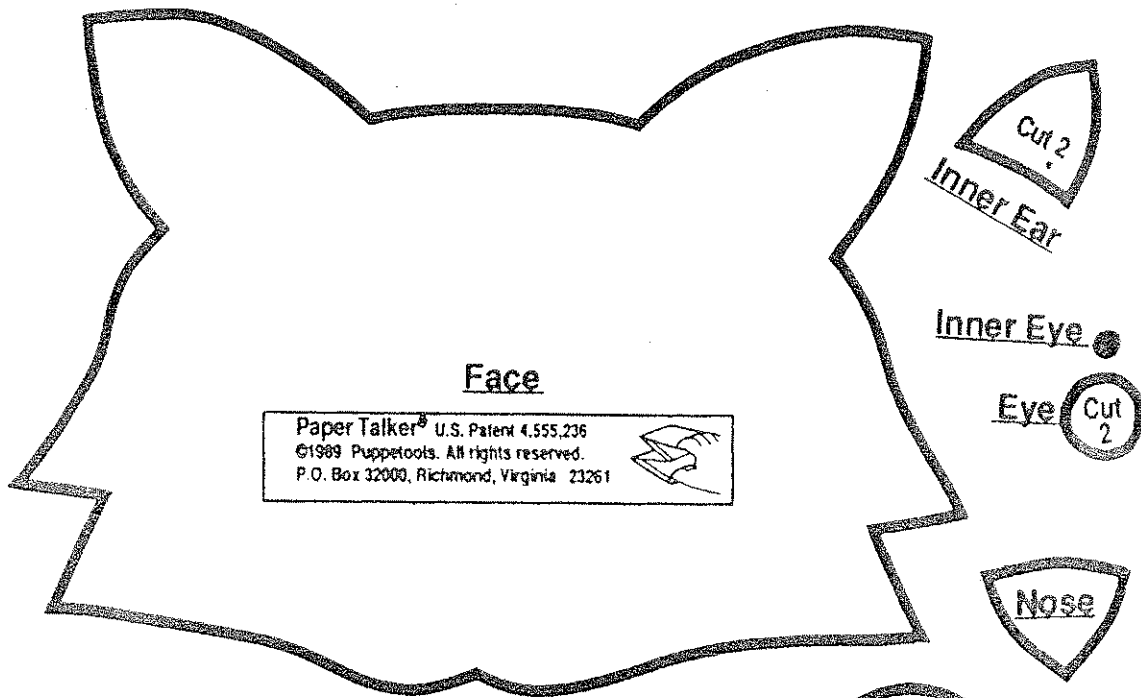
Cheek
Cut 2

Tongue


Tail

SQUIRREL
PAGE 2

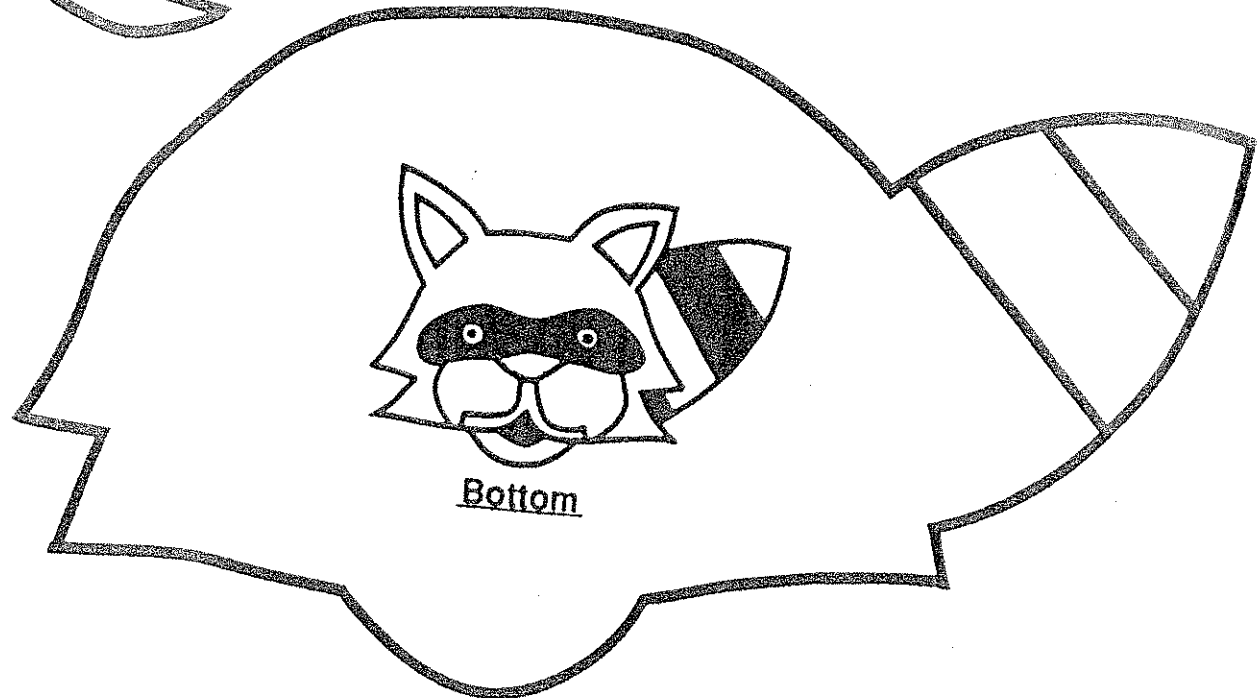
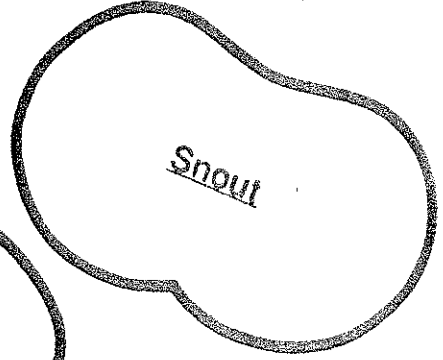
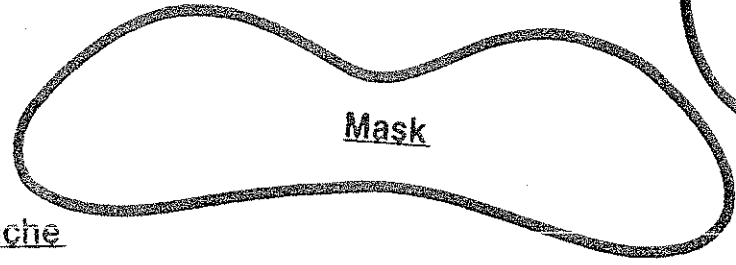




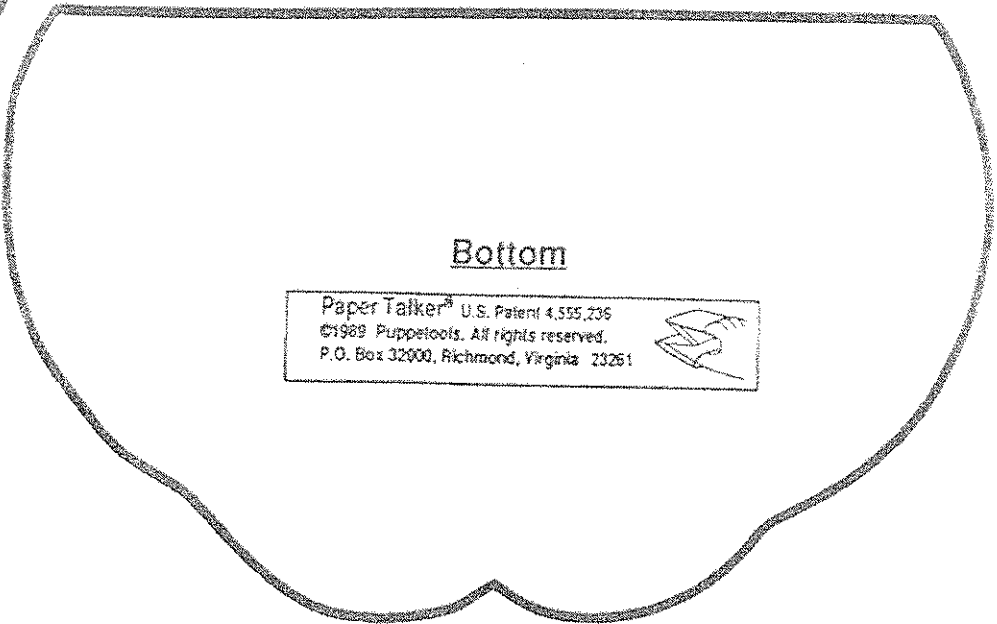
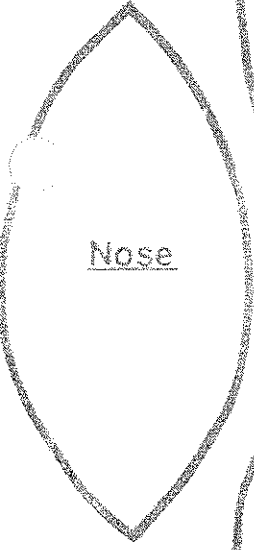
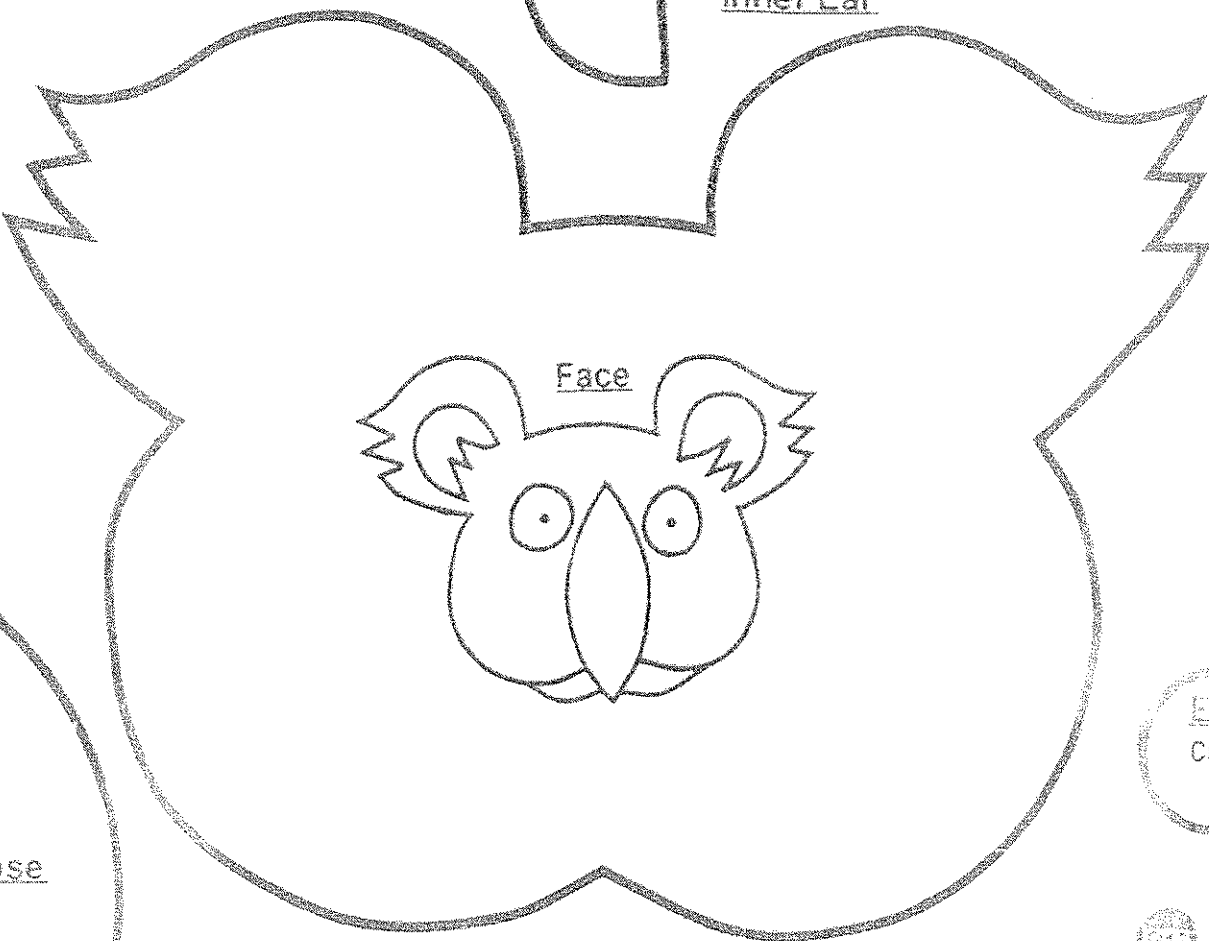
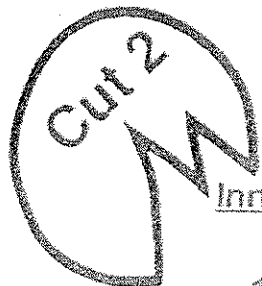
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RACCOON



KOALA

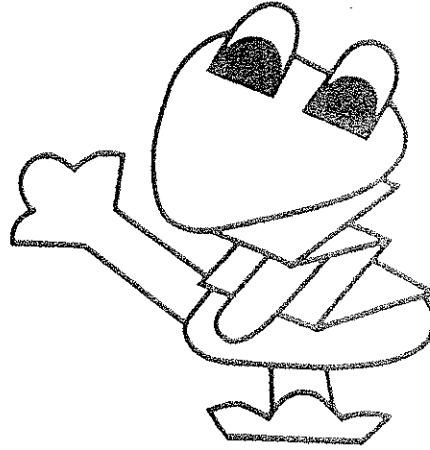


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"VICTOR"

Body
Cut 2



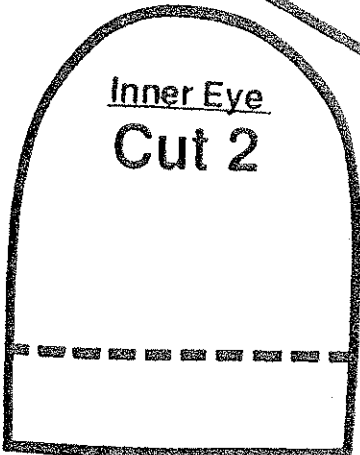
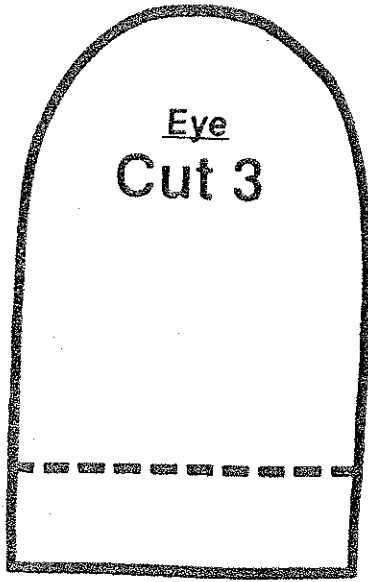
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Leg
Cut 2

Eye
Cut 3

Inner Eye
Cut 2



FOX

Inner Ear

Face

Nose

Cut 2

Eye Center

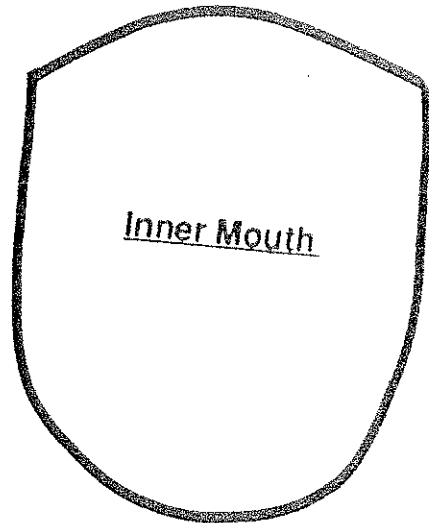
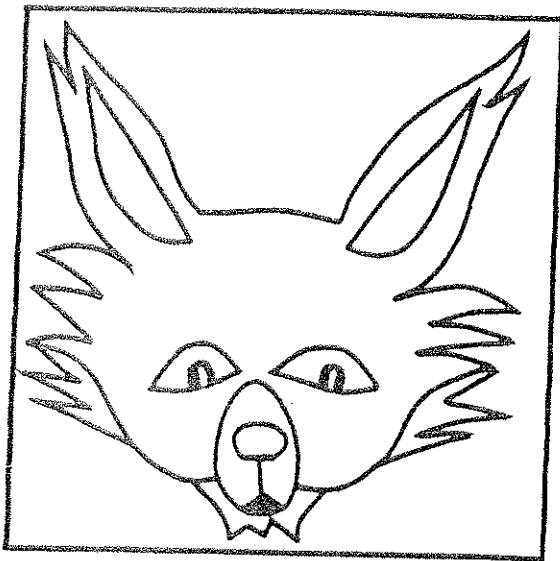
Cut 2

Inner Eye

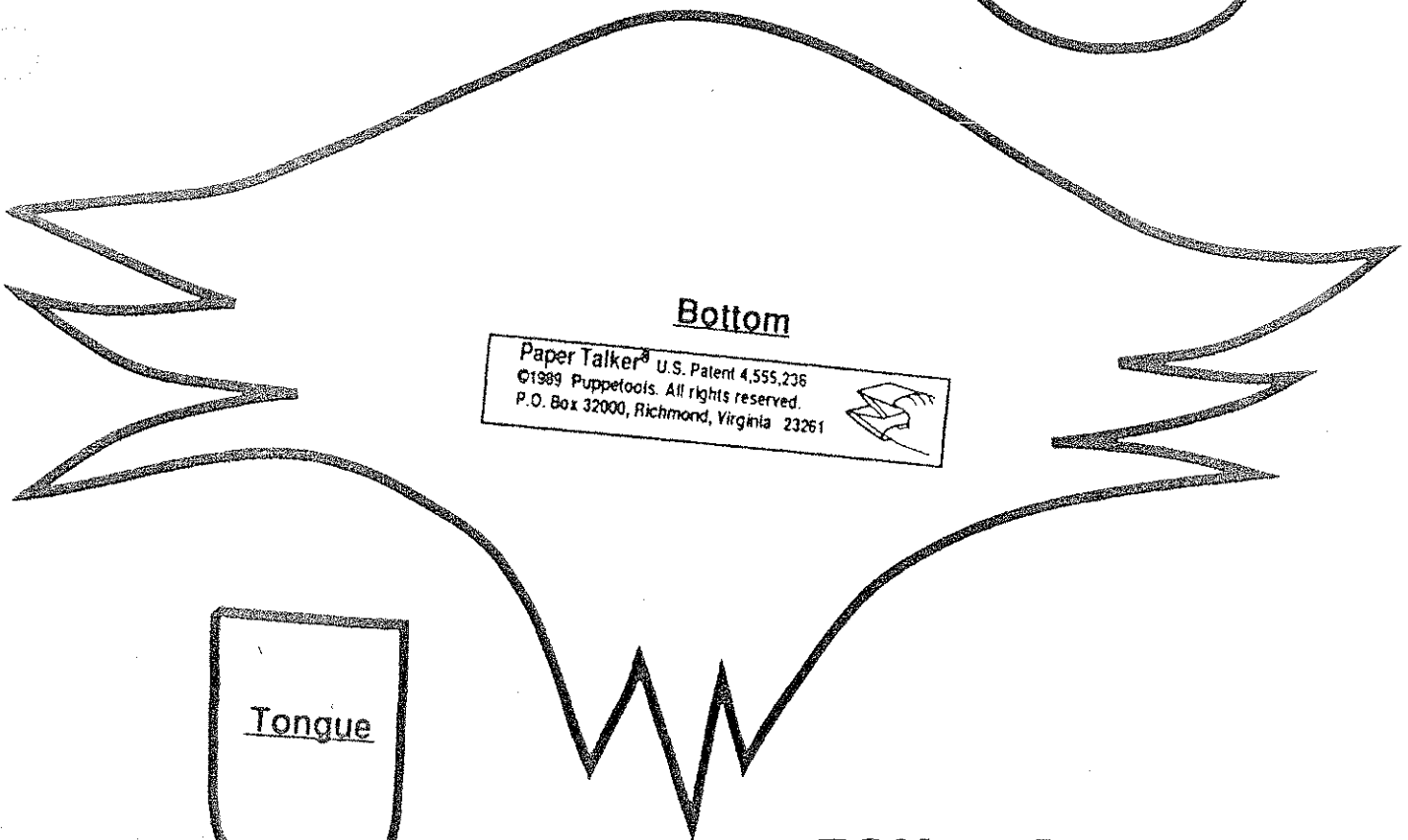
Eye
Cut 2

Snout



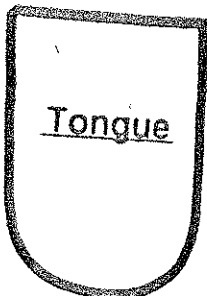


Inner Mouth



Bottom

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Tongue

FOX

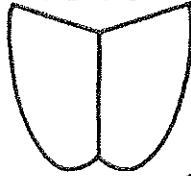
PAGE 2

Nose

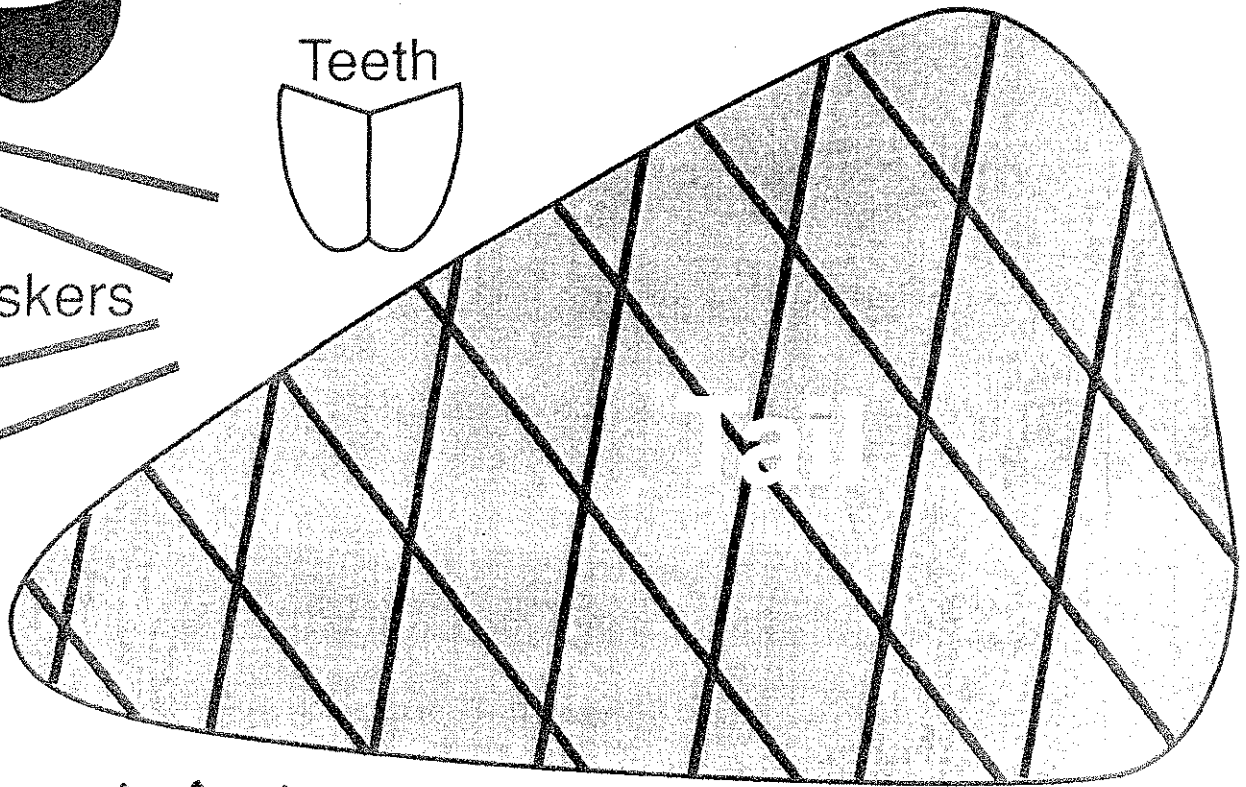


Eyes

Teeth



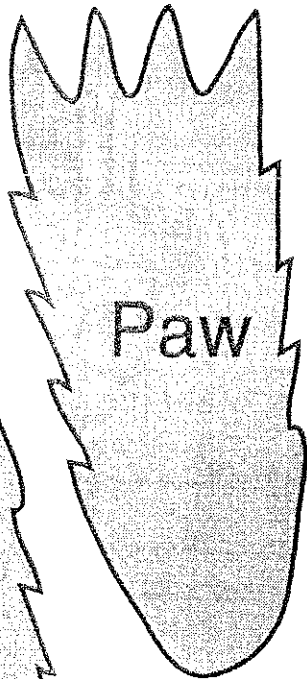
Whiskers



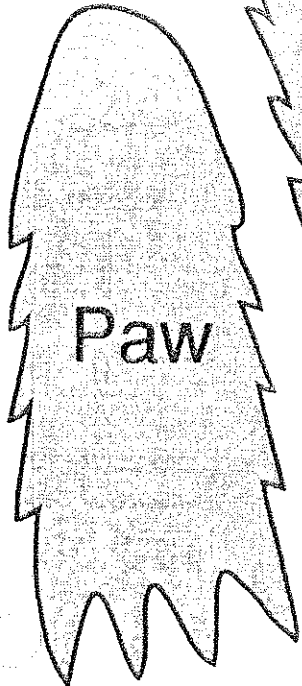
Tail



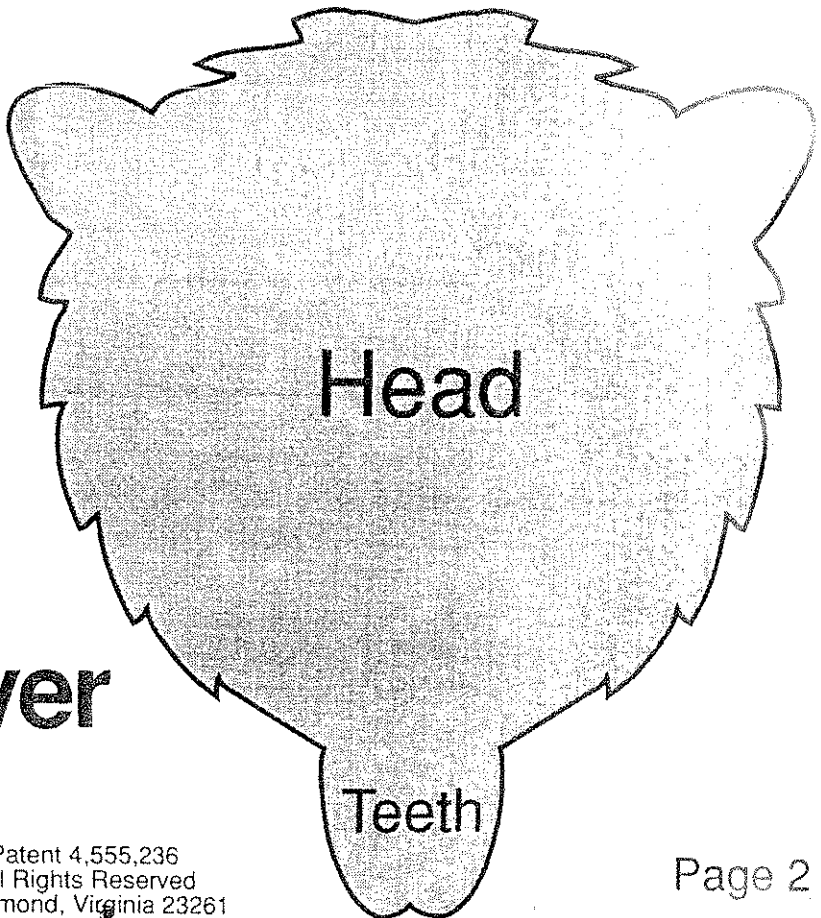
Inner Ears



Paw



Paw



Head

Beaver

Teeth

Inner Eye

Cut 12

FISH

Eye
Cut 2

Body

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Upper Lip

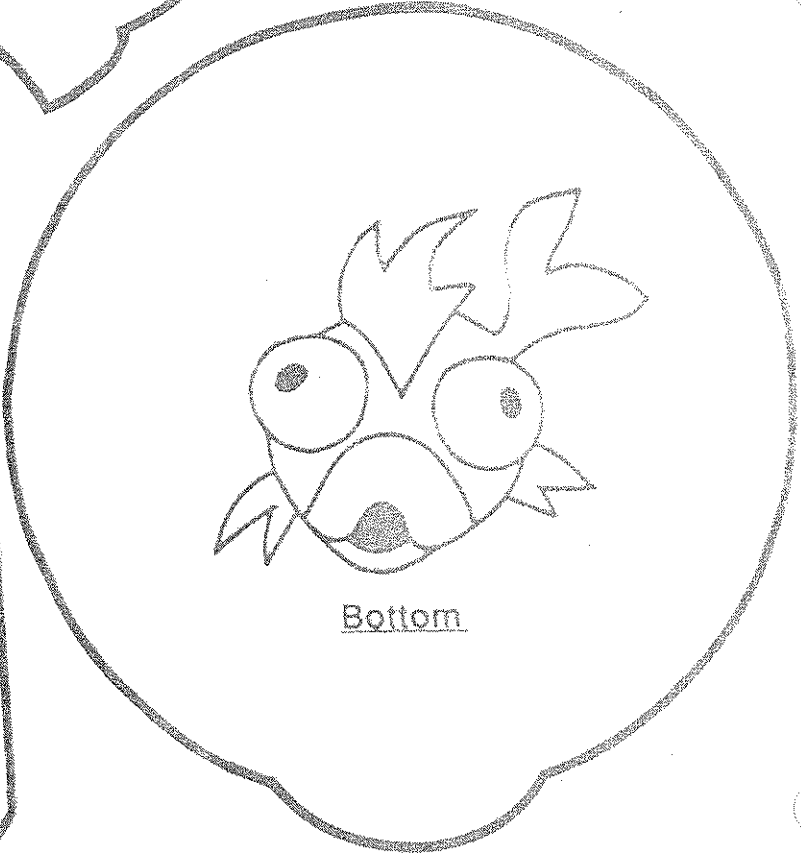
Lower Lip

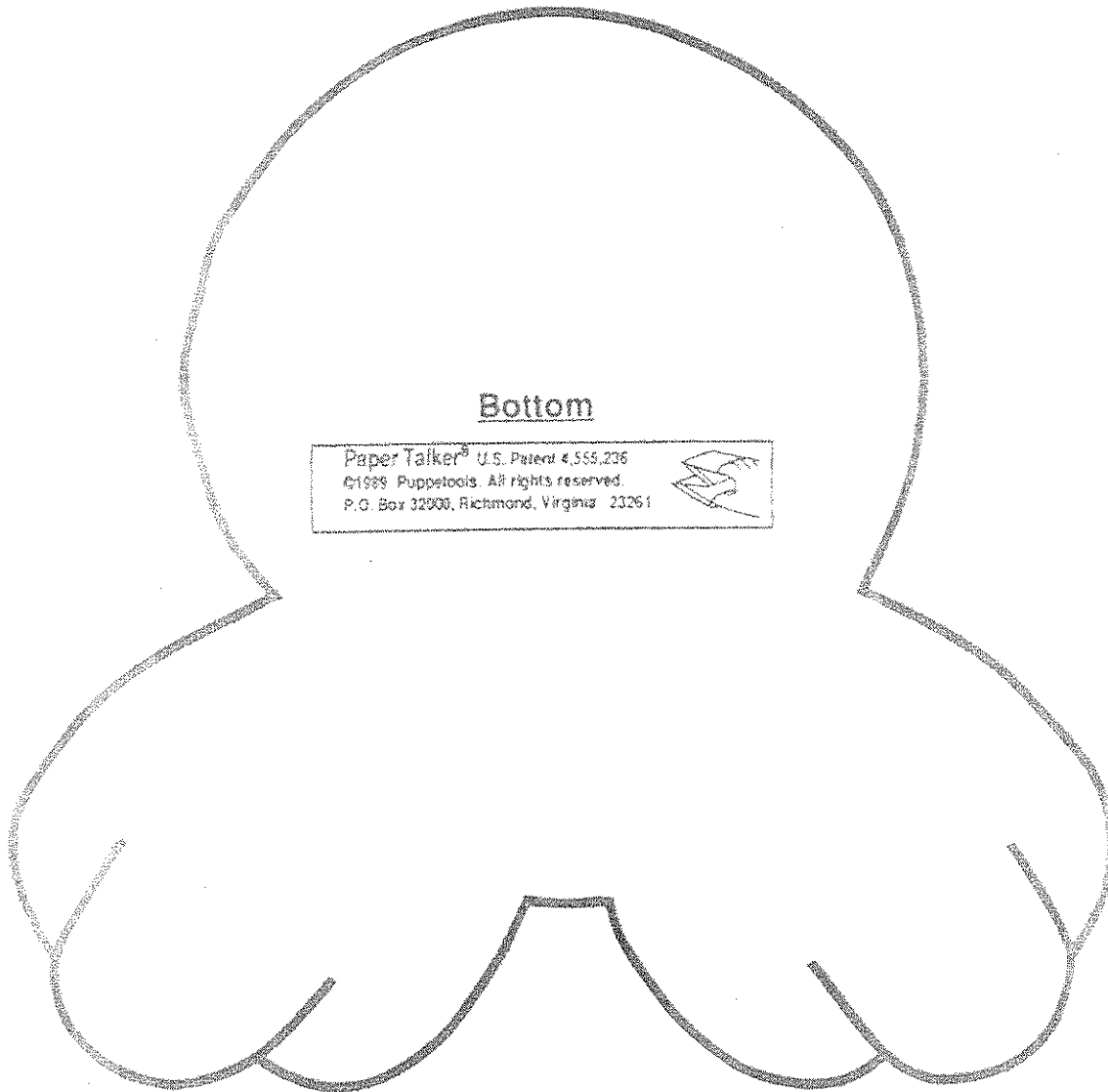
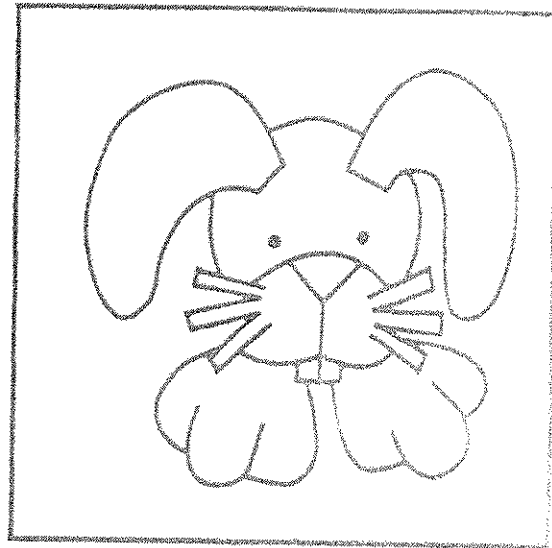
Fin

Tongue

Bottom

Fins



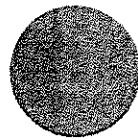
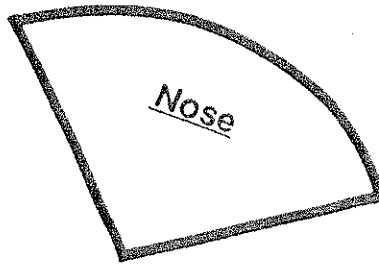


Bottom

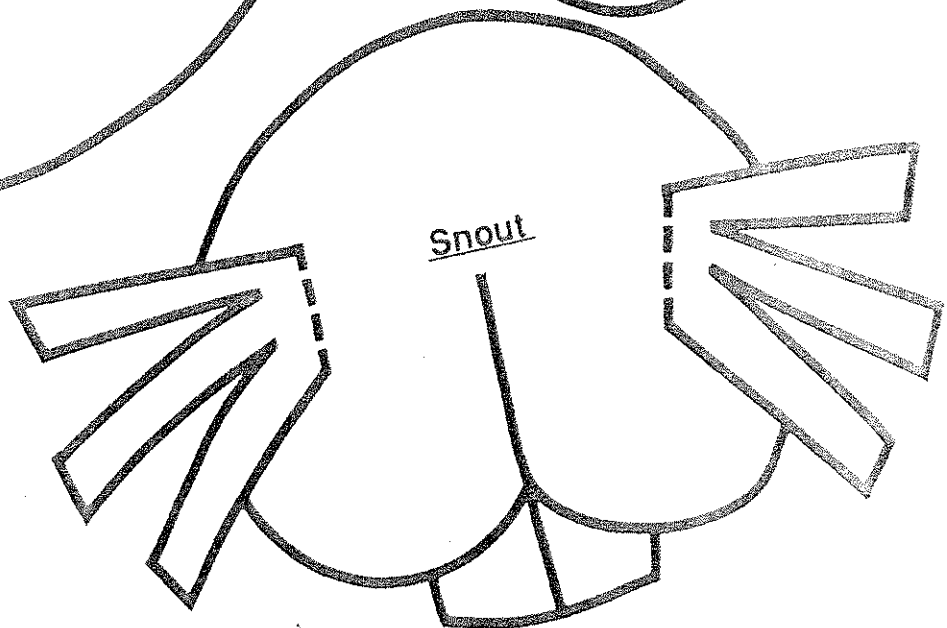
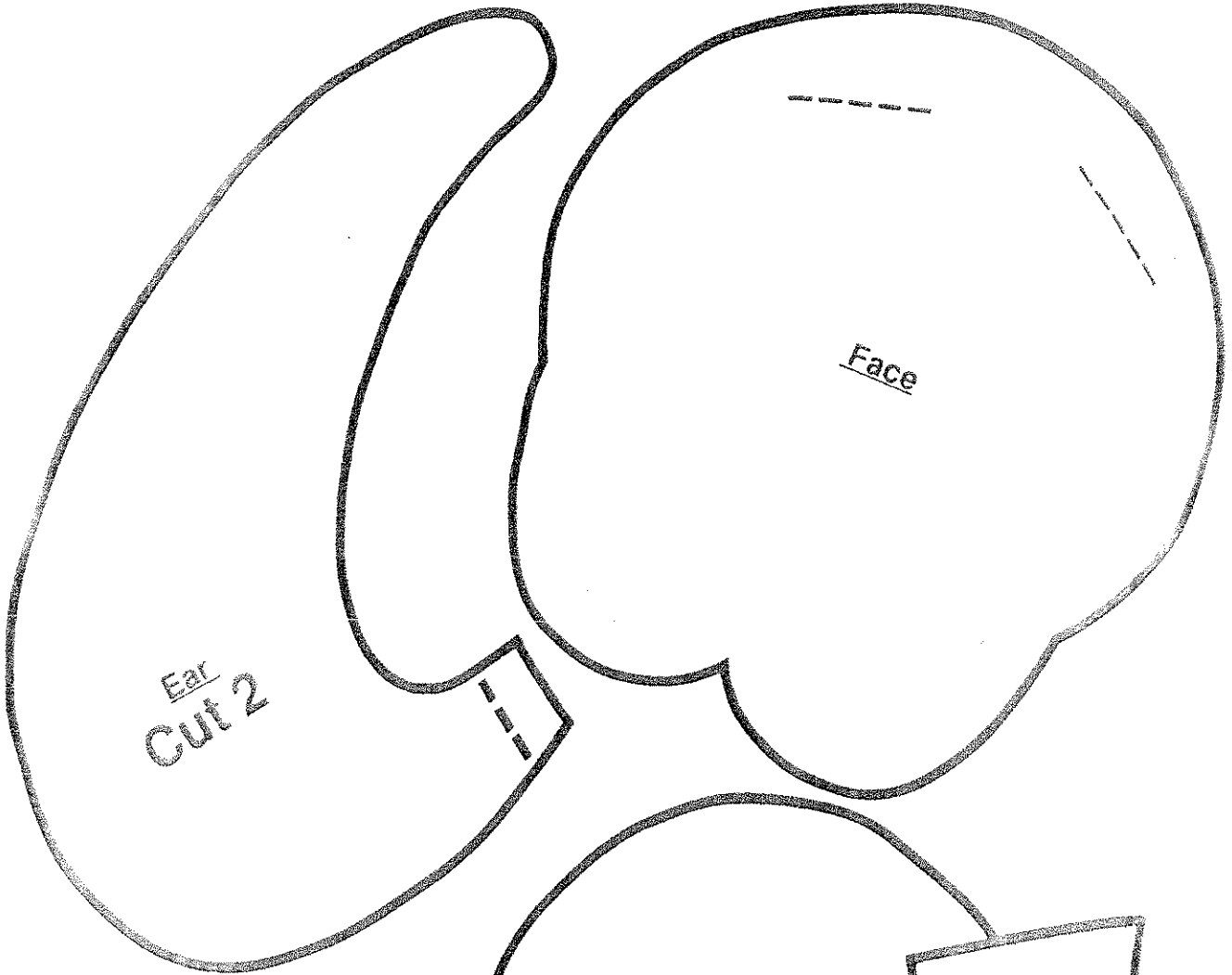
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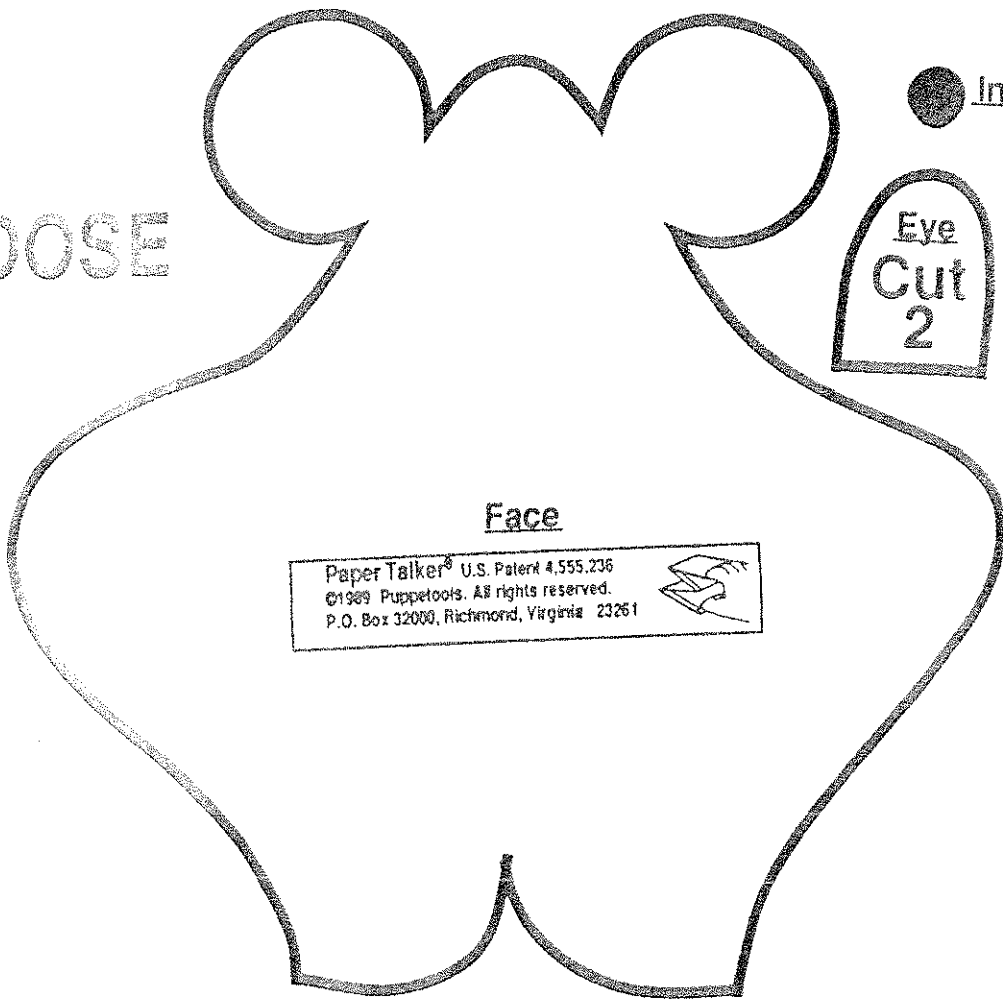
RABBIT



Eye **Cut 2**



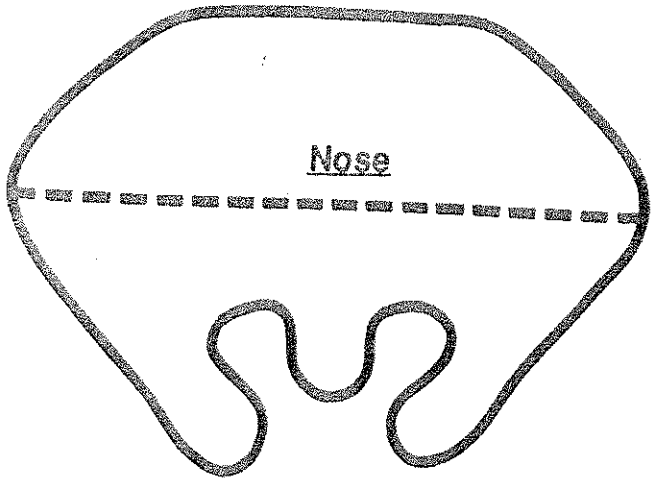
MOOSE

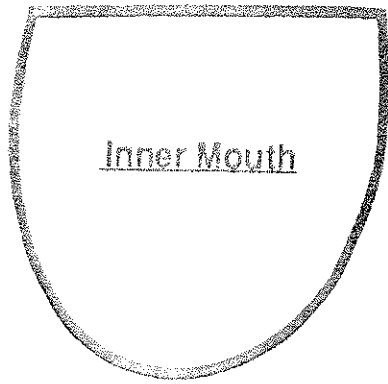


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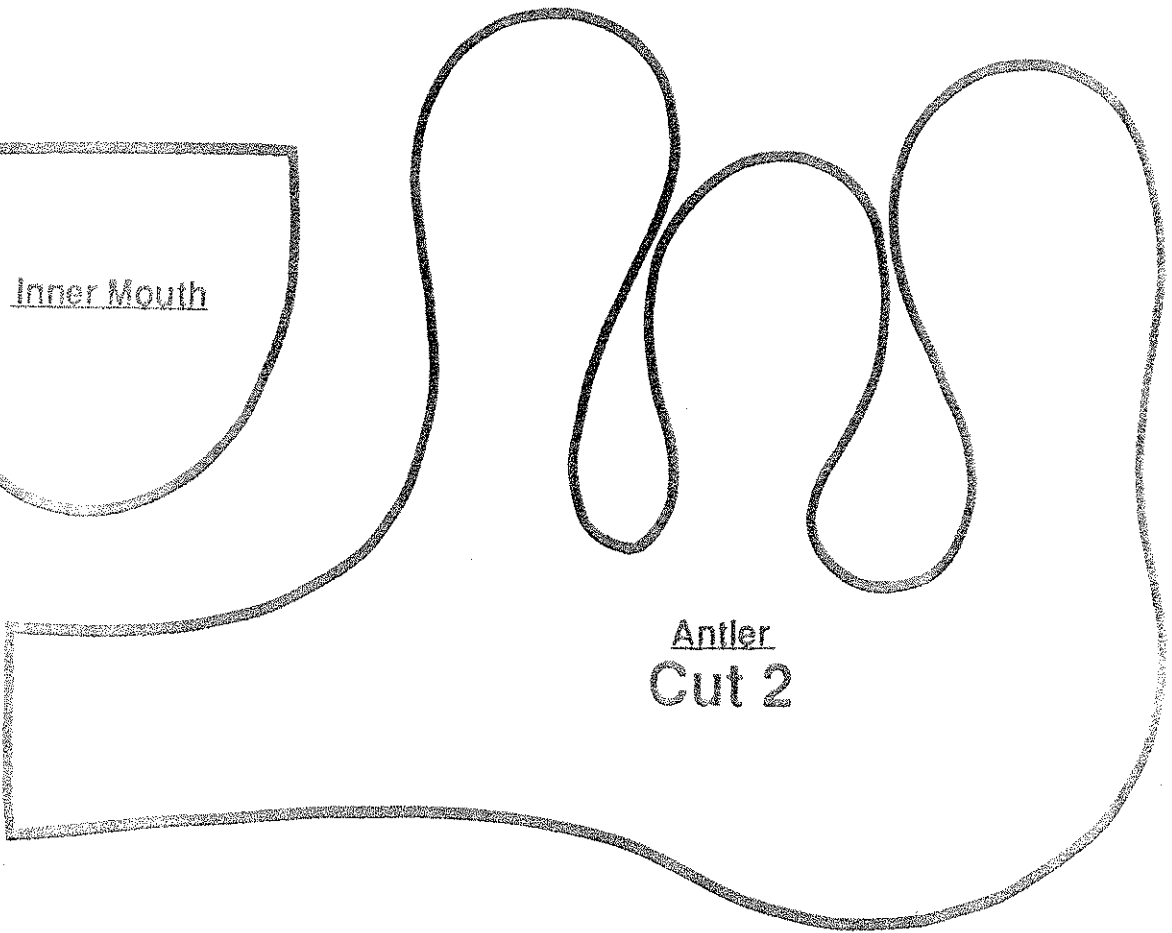


● Inner Eye

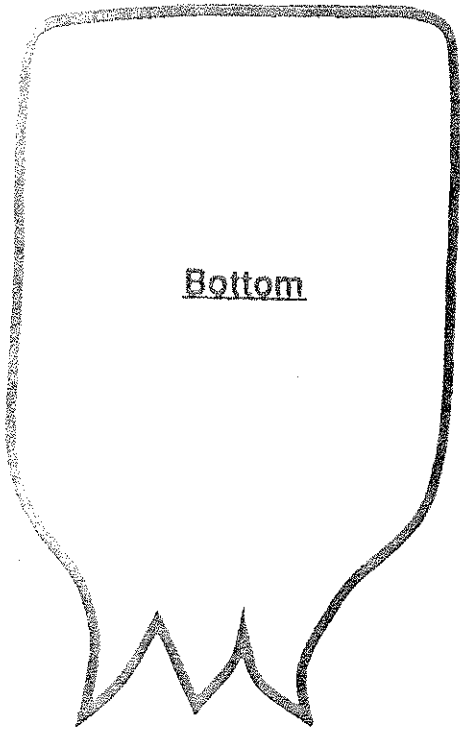




Inner Mouth

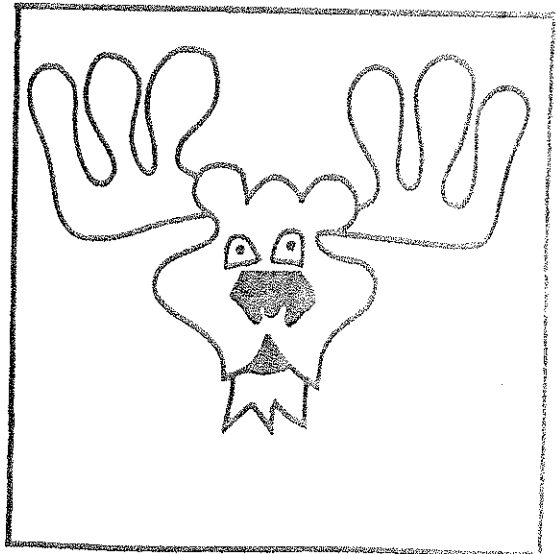


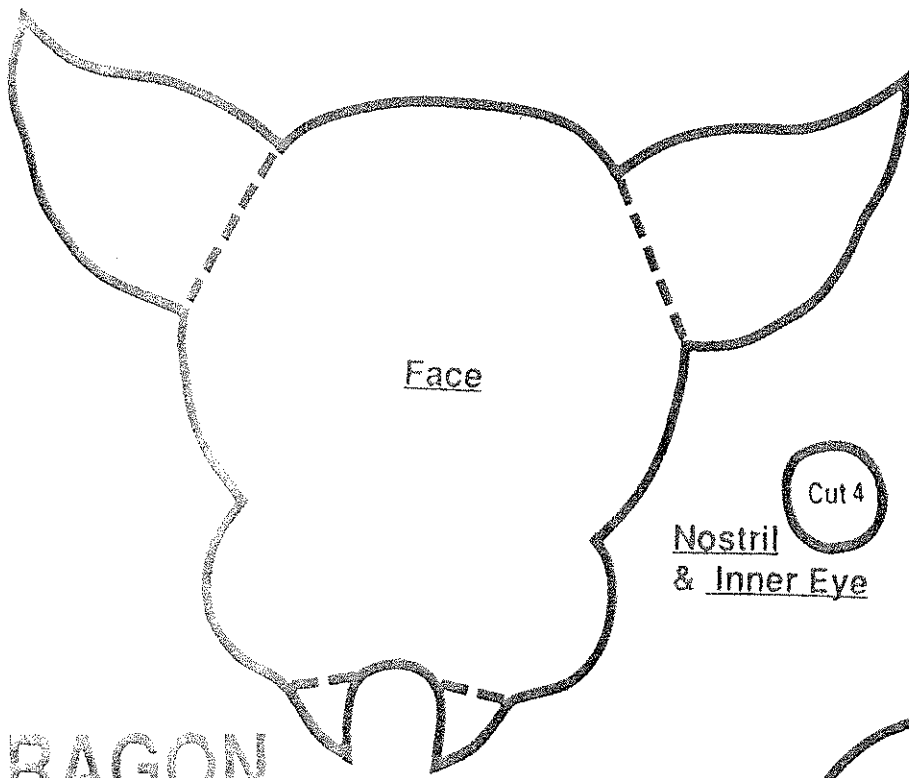
Antler
Cut 2



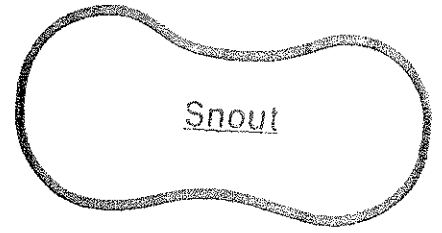
Bottom

MOOSE PAGE 2





Face

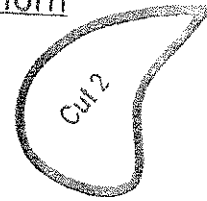


Snout



Nostril & Inner Eye

Horn

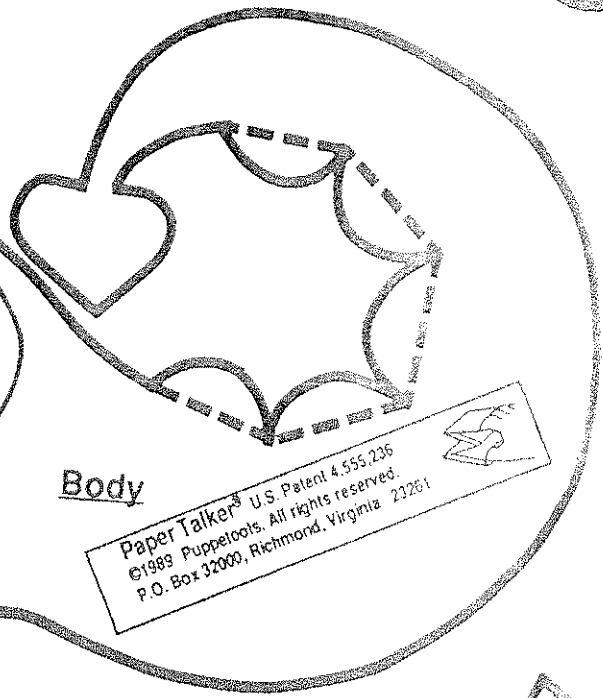


Cut 2



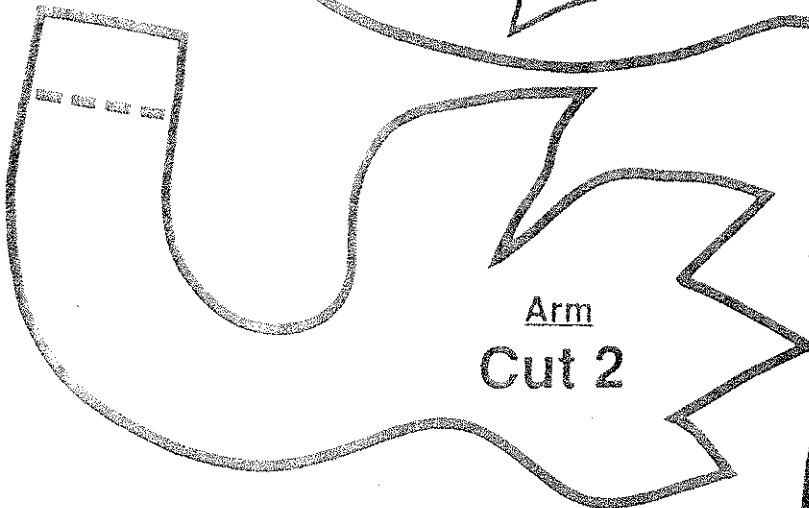
Eye
Cut 2

DRAGON

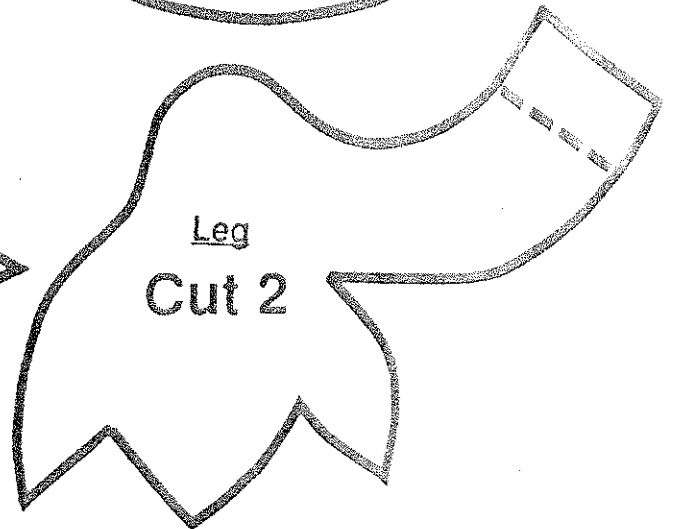


Body

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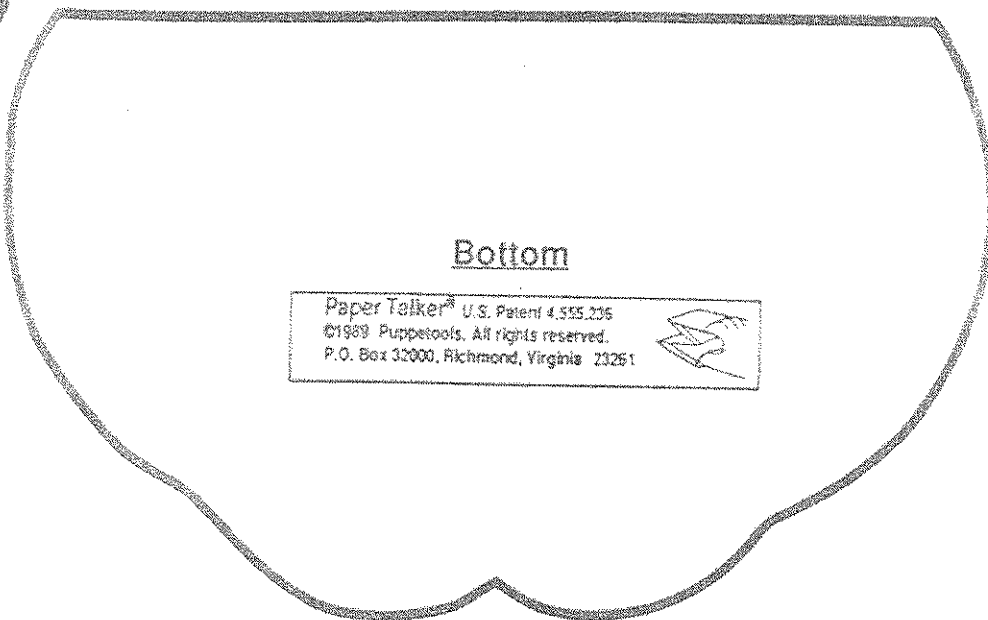
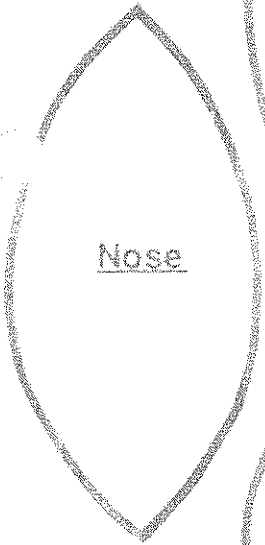
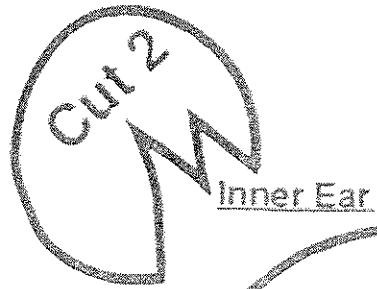


Arm
Cut 2



Leg
Cut 2

KOALA

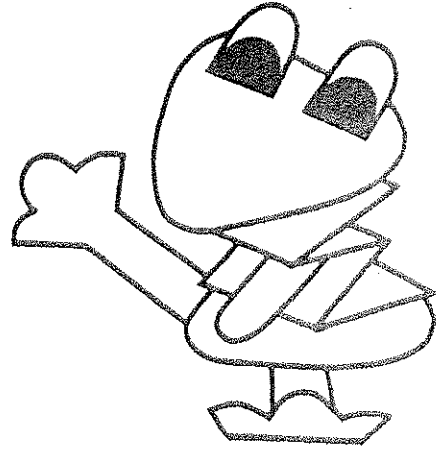


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"VICTOR"

Body
Cut 2



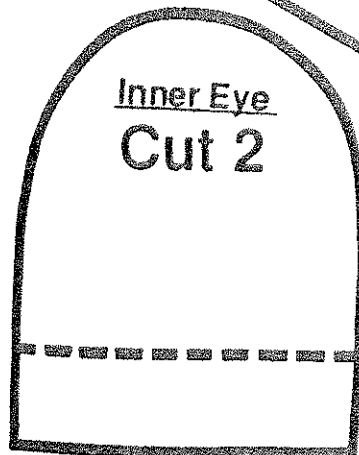
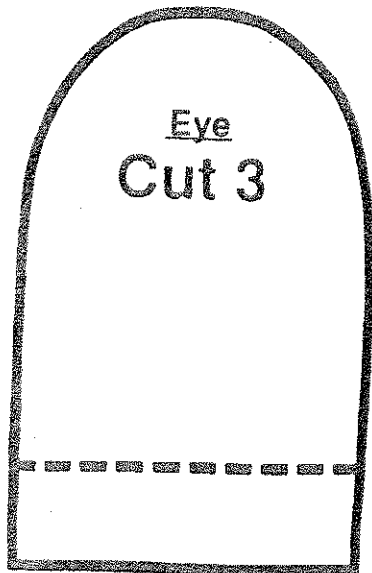
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Leg
Cut 2

Eye
Cut 3

Inner Eye
Cut 2



FOX

Inner Ear

Face

Nose

Cut 2

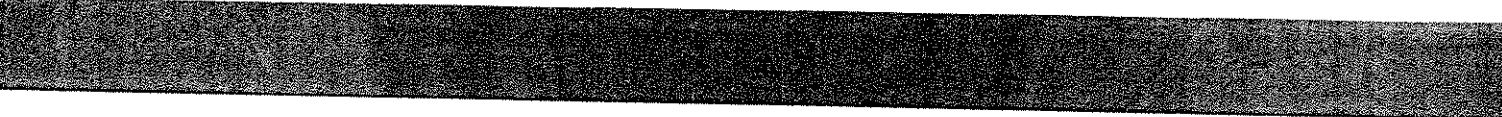
Eye Center

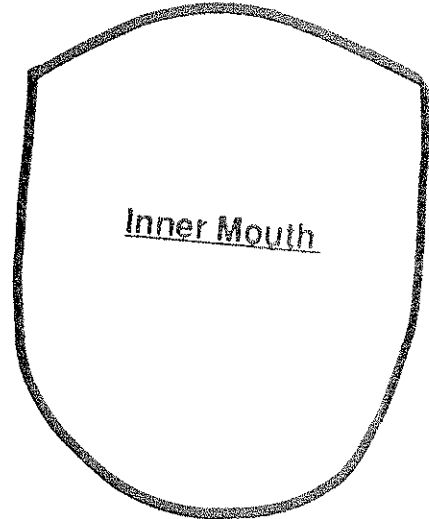
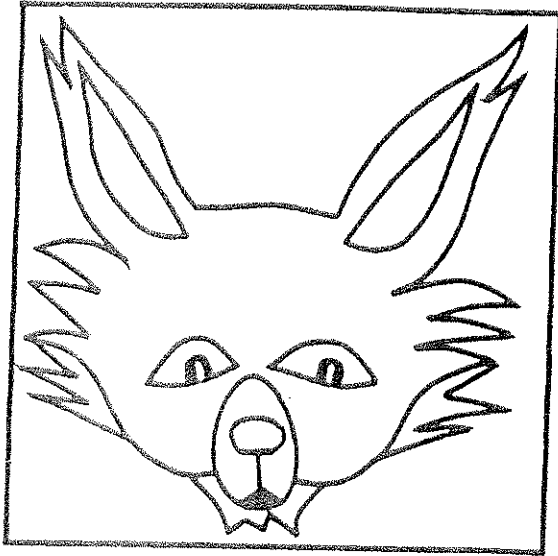
Cut 2

Inner Eye

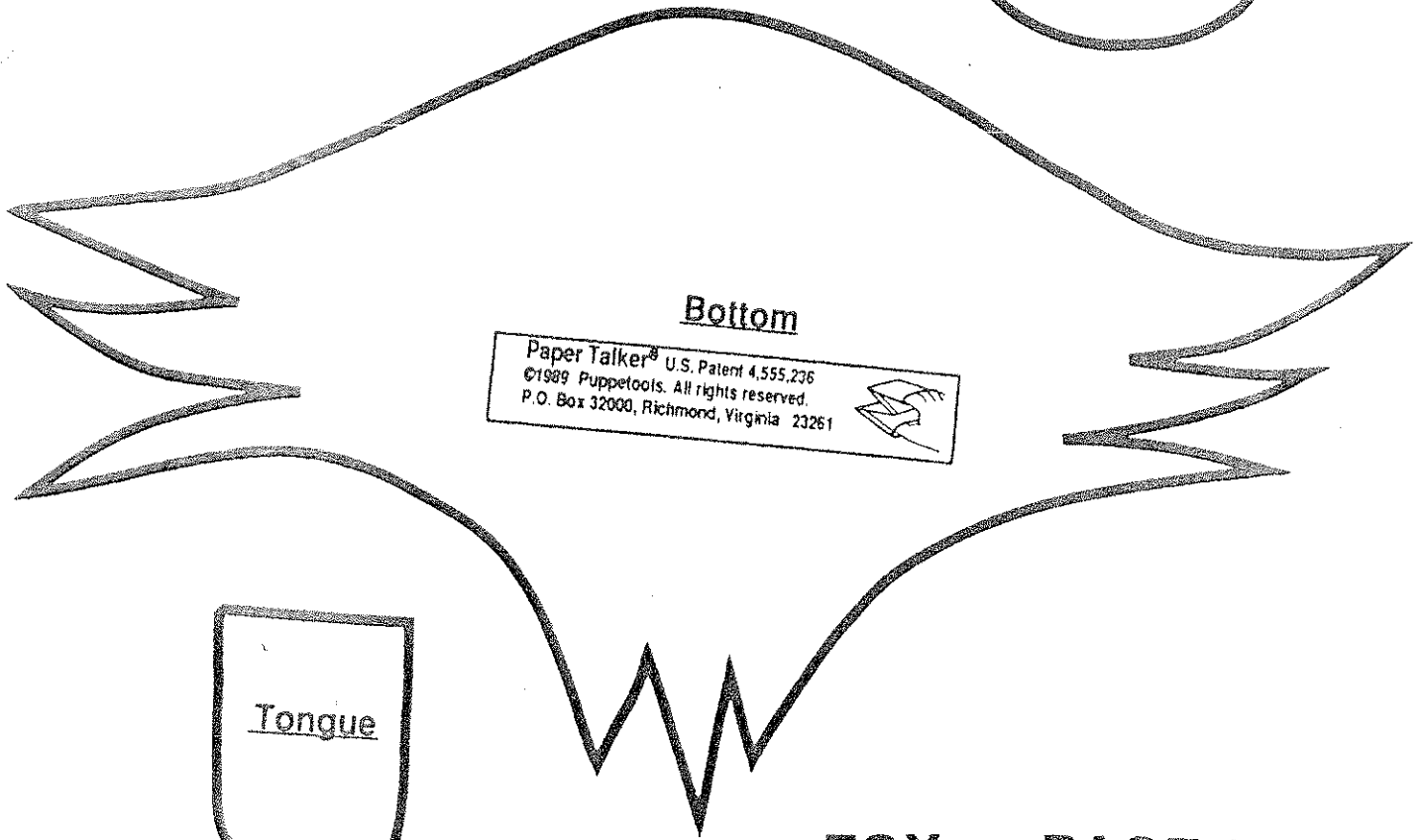
Eye
Cut 2

Snout



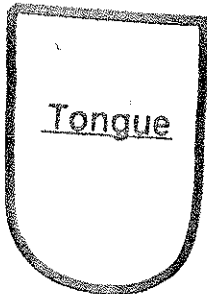


Inner Mouth



Bottom

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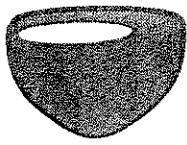


Tongue

FOX

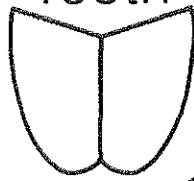
PAGE 2

Nose

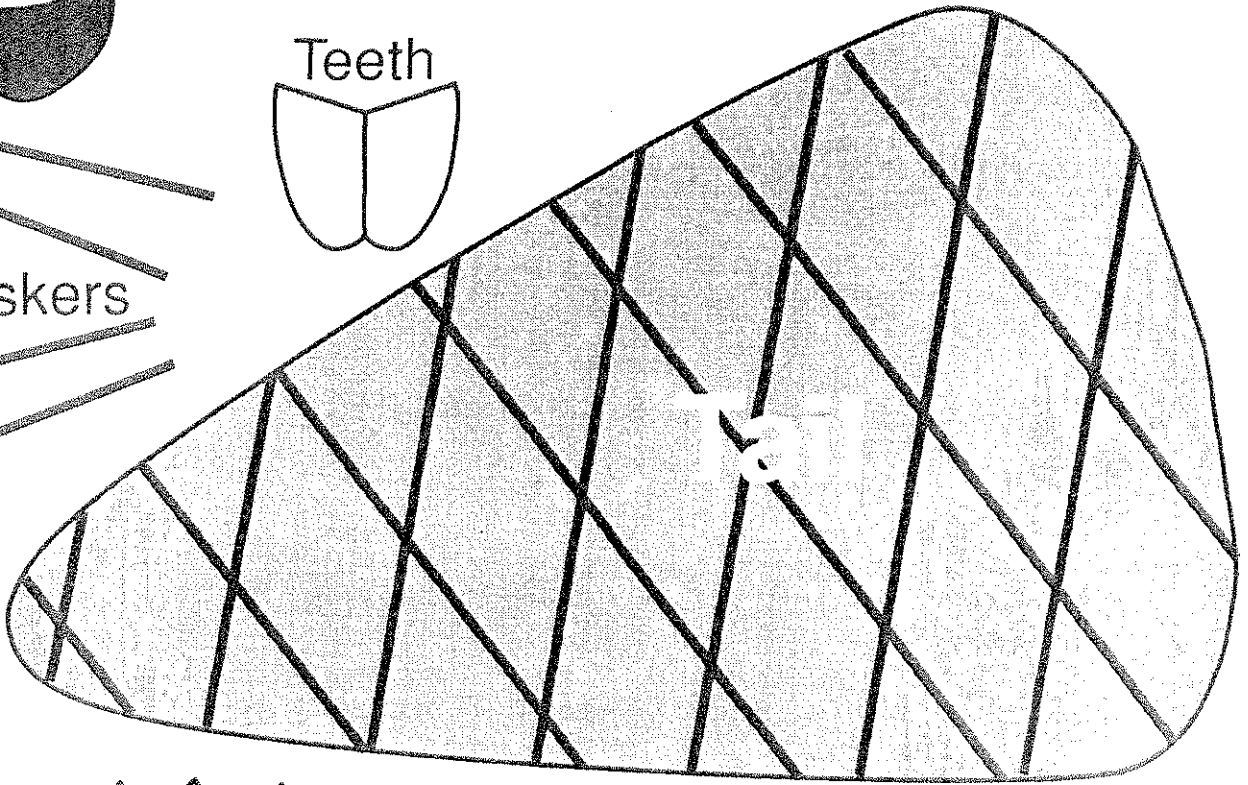


Eyes

Teeth

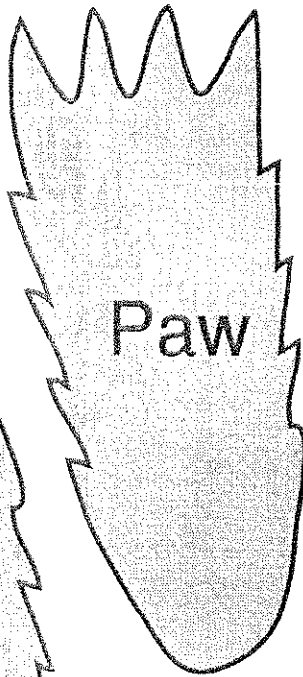


Whiskers

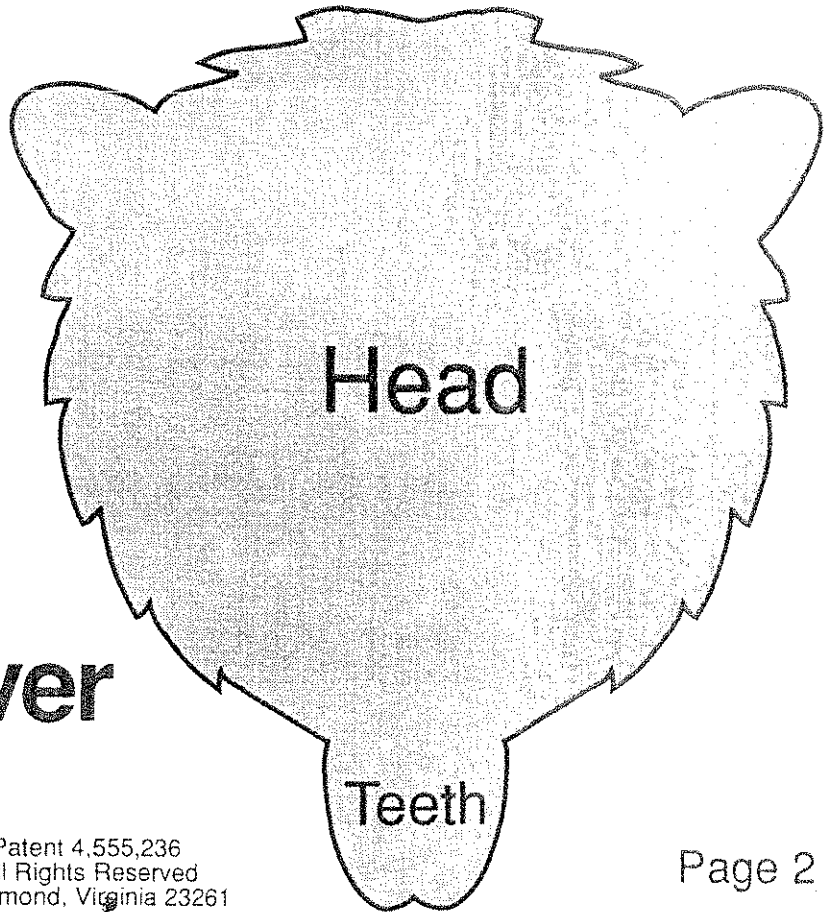


Teeth

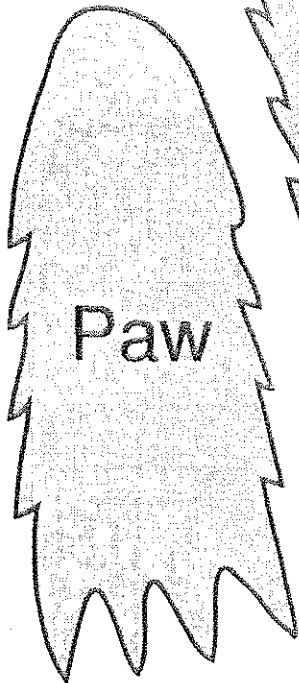
Inner Ears



Paw



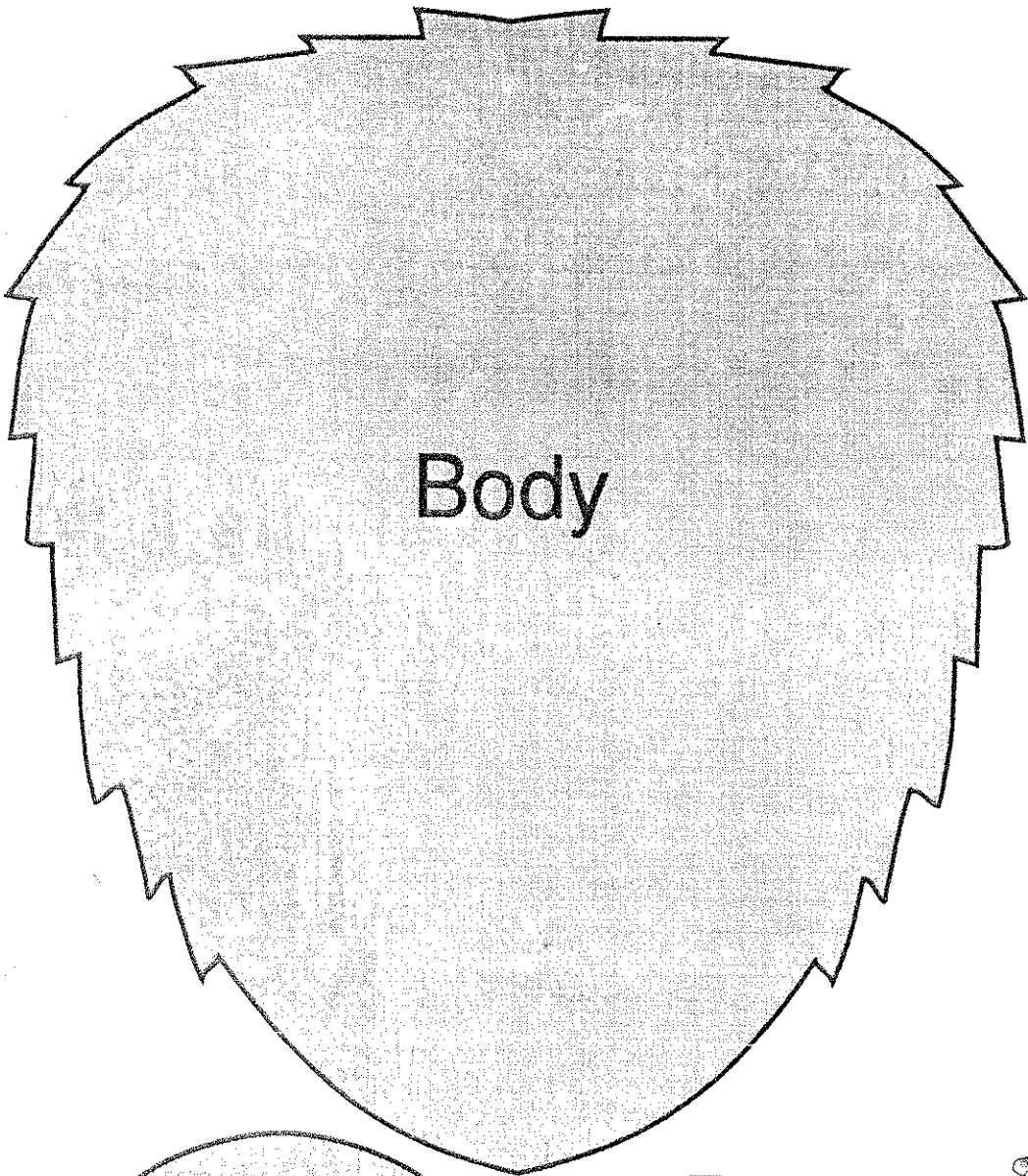
Head



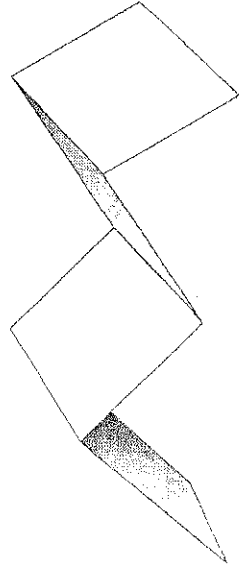
Paw

Beaver

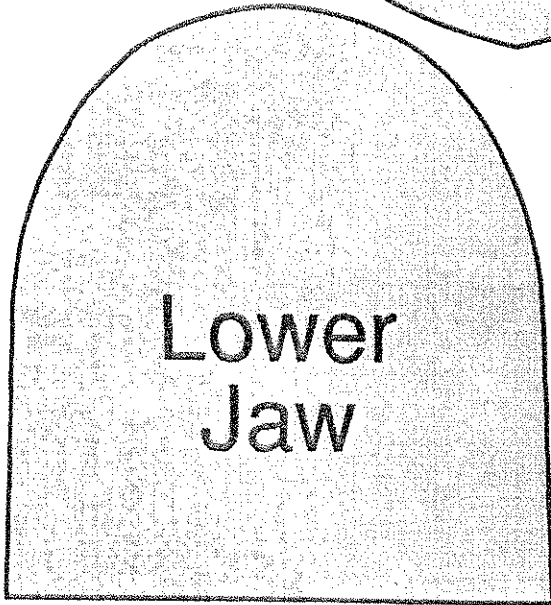
Teeth



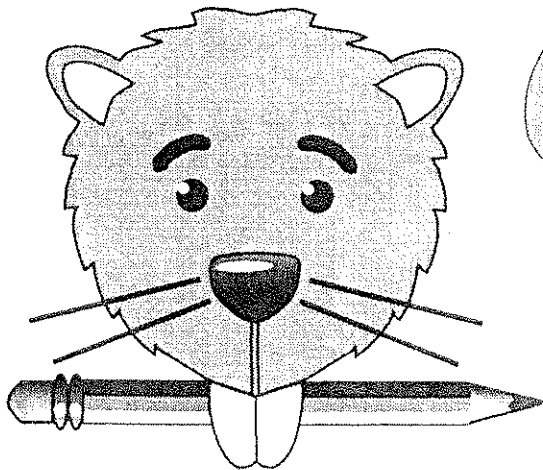
Body



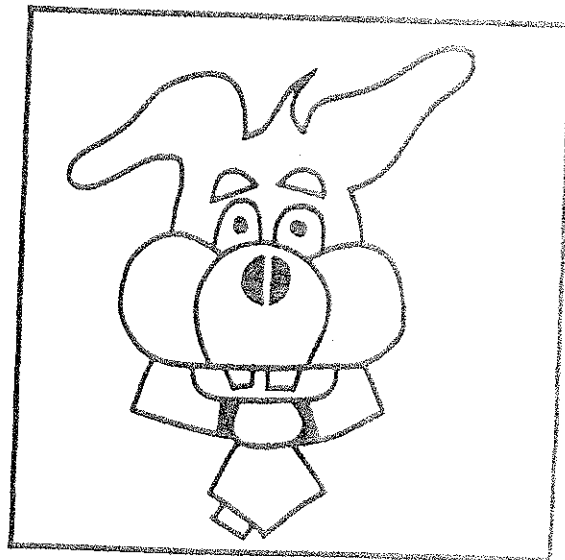
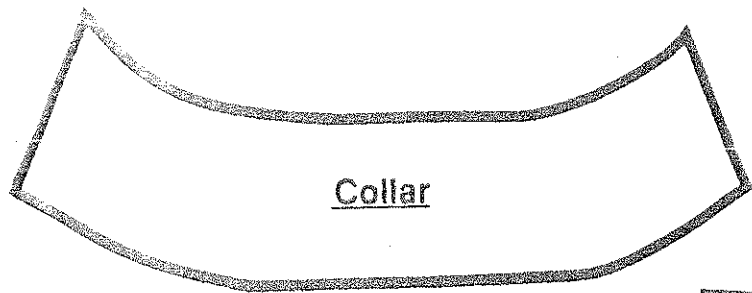
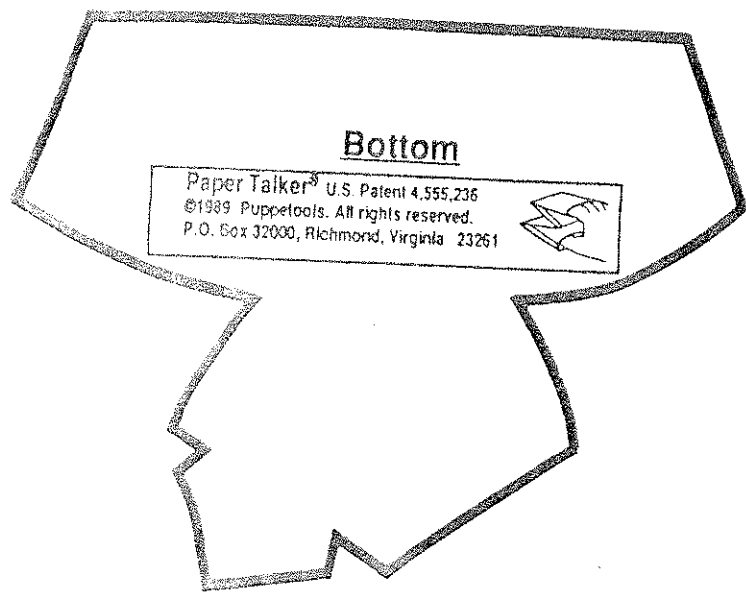
Beaver

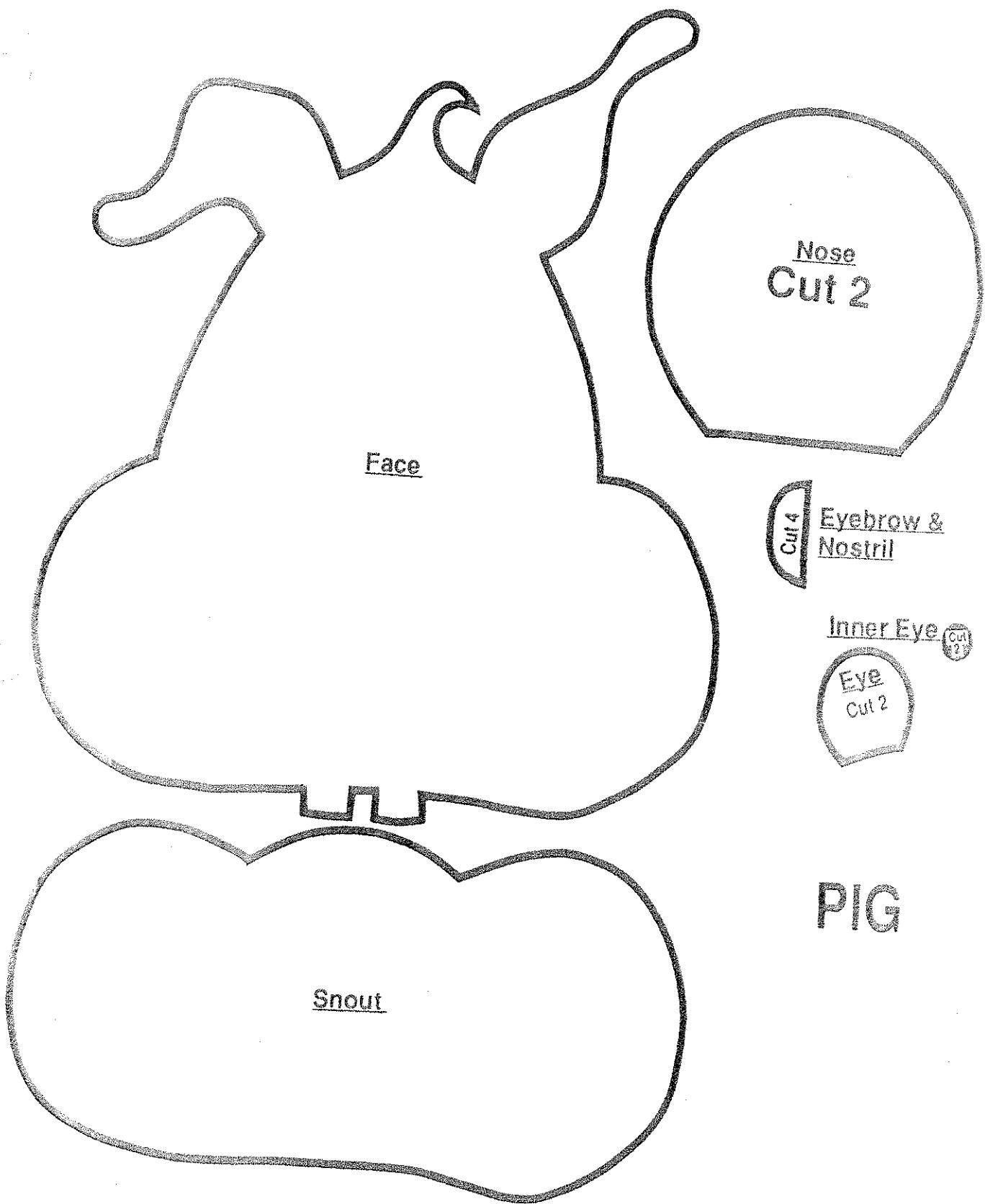


Lower
Jaw



Pencil





Face

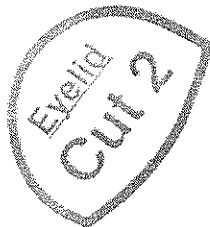
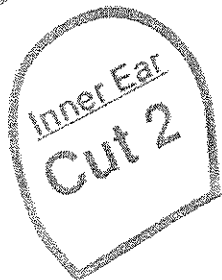
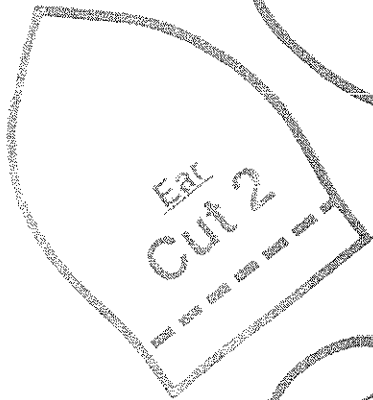
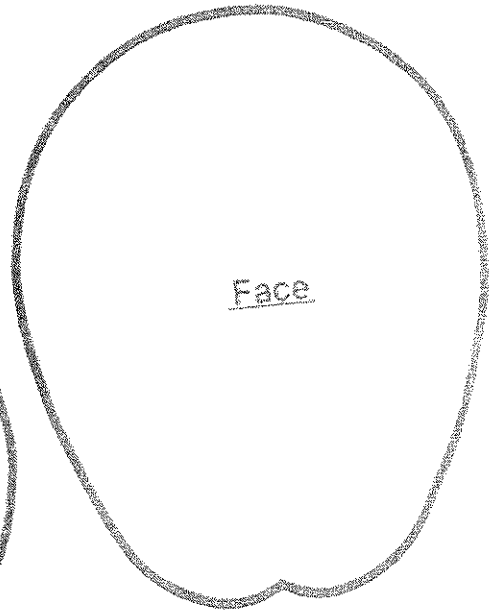
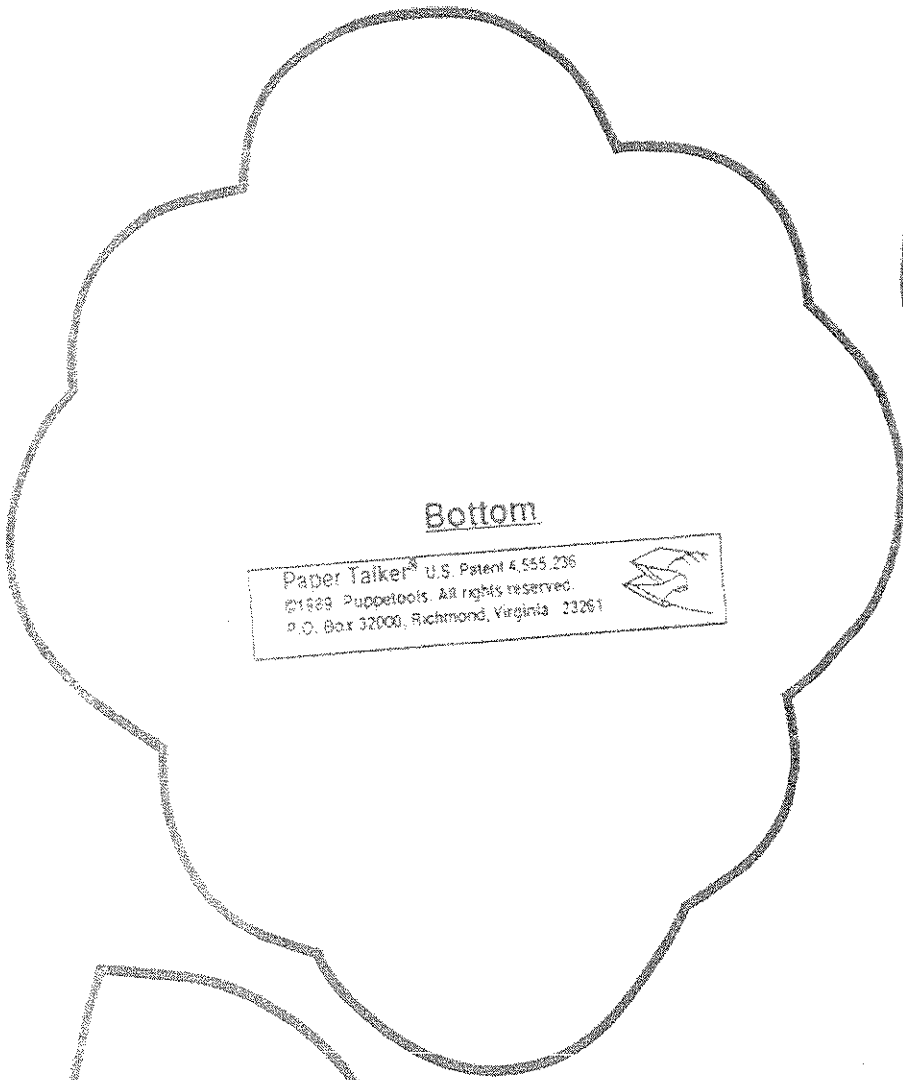
Nose
Cut 2

Eyebrow & Nostril
Cut 4

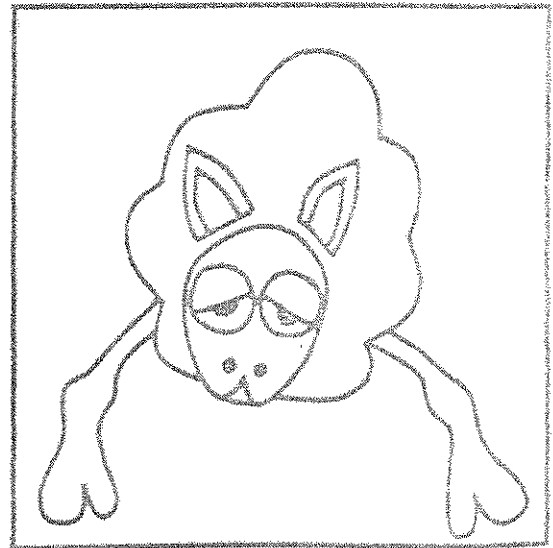
Inner Eye Cut 2
Eye
Cut 2

PIG

Snout

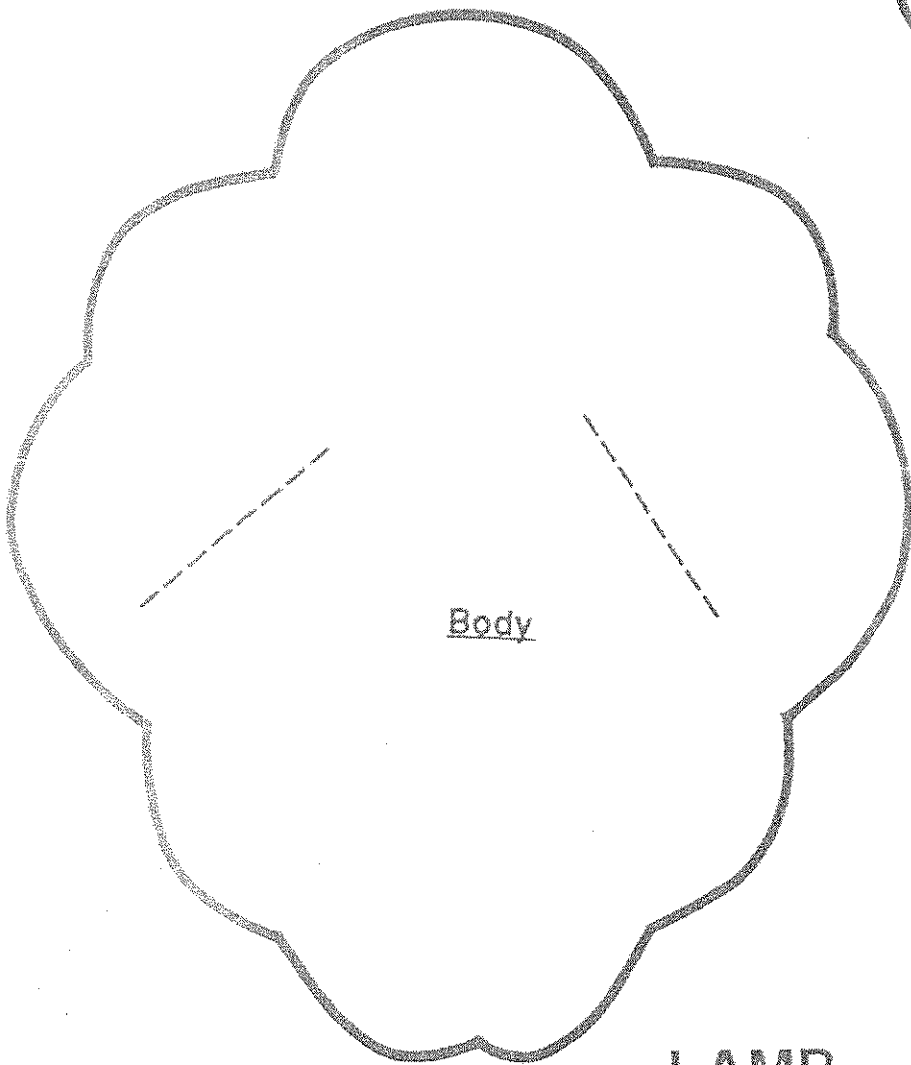


LAMB





Leg
Cut 2

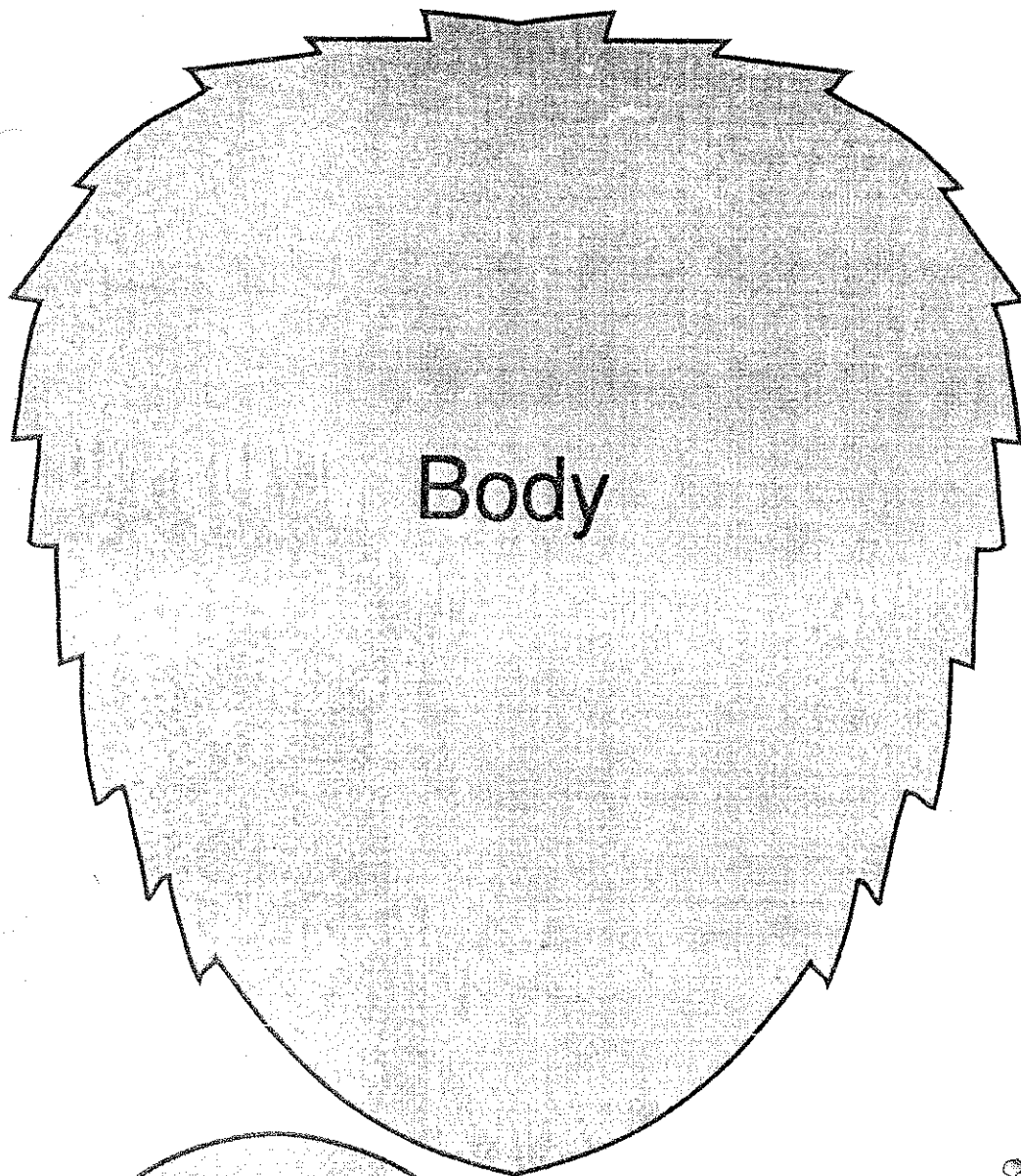


Body

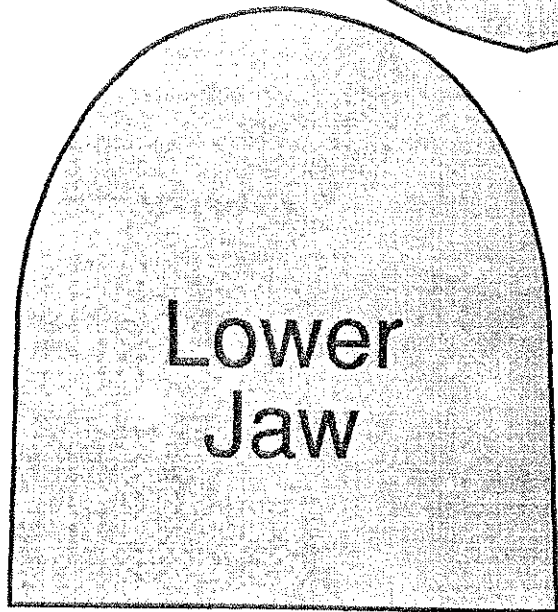
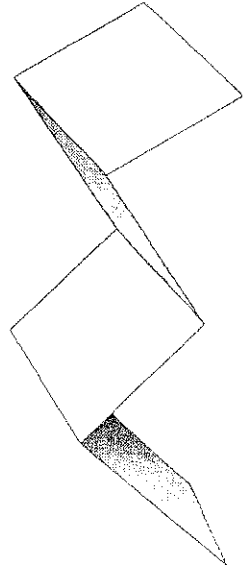
LAMB

PAGE 2



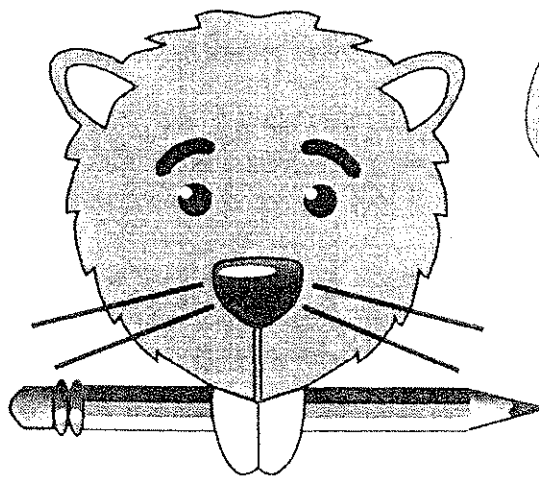


Body



Lower
Jaw

Beaver



Pencil

Page 1