

Aug. 29, 1950

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2,520,491

PUPPET FOR STOP-MOTION TECHNIQUE

Filed Jan. 3, 1945

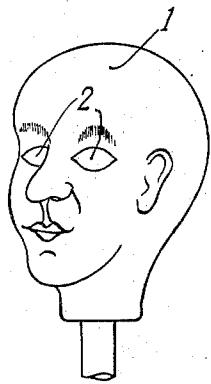


Fig. 1

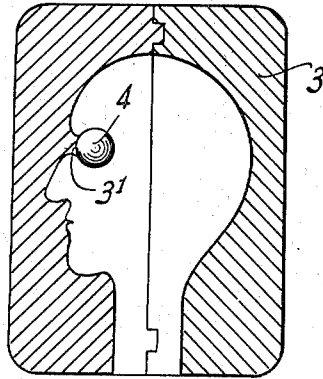


Fig. 2

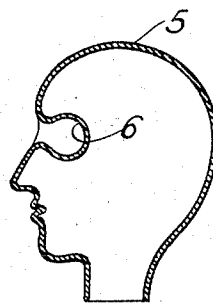


Fig. 3

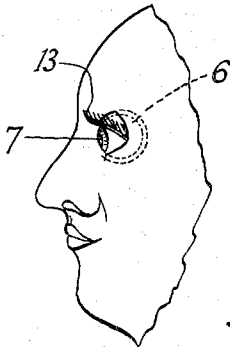


Fig. 4



Fig. 5

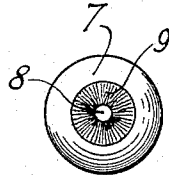


Fig. 6

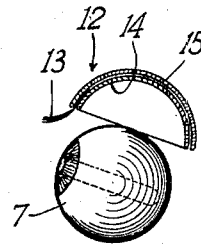


Fig. 7

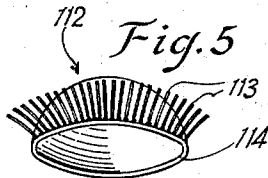


Fig. 10

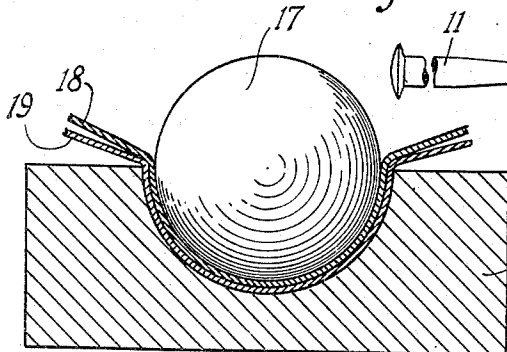


Fig. 9

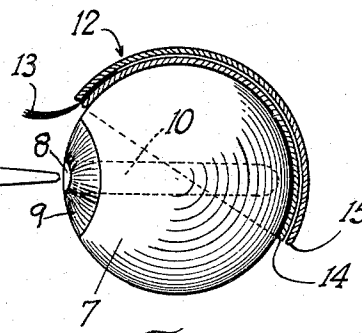


Fig. 8

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# UNITED STATES PATENT OFFICE

2,520,491

## PUPPET FOR STOP-MOTION TECHNIQUE

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Application January 3, 1945, Serial No. 571,185

5 Claims. (Cl. 46-168).

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This invention relates to puppets used in the production of animated moving pictures by so-called stop-motion technique. In the production of such animated pictures it has been found advantageous to use puppets to effect the desired series of increments of motion, instead of making use of successive drawings, for the reason that the successive frames of the picture can be filmed from puppets in changed position in less time and with less labor than is required for the production of successive drawings. Also puppet sets give a better three-dimensional effect, than do drawings.

It is an object of the invention to provide a puppet having an eye structure which may be manually adjusted to any position within the range of natural eye movement without the necessity of special mechanism within the puppet head.

It is also an object of the invention to provide a puppet having an eyeball and an eyelid which are capable of independent adjustment to any desirable position relative to each other and to the surrounding parts of the head.

It is a further object of the invention to improve the mode of attachment of eyelashes to the eyelid to obtain durability and natural appearance.

It is a still further object of the invention to provide a distortable puppet head having improved eye sockets adapted to cooperate with movable eyeballs and eyelids.

Other objects and details of the invention will appear in the following description wherein I have disclosed the best form in which I have contemplated applying my invention.

In the drawings;

Fig. 1 is a perspective view of a clay pattern for the production of the mold used in the casting of a distortable, hollow puppet head pursuant to the present invention;

Fig. 2 is a sectional view of the mold, showing the manner of attaching a core for the eyeball socket;

Fig. 3 is a view of the puppet head in profile section, a portion of the line of section being offset to pass through one of the eye sockets;

Fig. 4 is a fragmentary perspective view showing the eyeball and eyelid assembled in the socket, certain parts being indicated in dotted lines;

Fig. 5 is an elevational view of a ball from which the eyeball is made;

Fig. 6 is a front elevation of the eyeball.

Figs. 7 and 8 are side elevations, partially in

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section, illustrating the relation to each other of the eyeball and the eyelid;

Fig. 9 is a sectional view of apparatus which may be used to shape eyelid parts; and

Fig. 10 is a perspective view of a slightly modified form of eyelid wherein the lashes are attached solely by means of solder or other adhesive.

In the puppet head in which my invention is embodied a molded rubber envelope 5 is made in any desired shape and with any desired features, which envelope has such stretching characteristics as may be suitable to the particular purpose for which the head is intended, as has been described in my Patent 2,237,751 granted April 8, 1941. The head disclosed is a human head; but the same principles are applicable to other than human, for example, animals, birds, bugs, or fanciful characters. In the production of the head, I make the envelope 5 of rubber or like material in substantially the manner described in my patent before mentioned, using an image or pattern 1, of clay or other material. In forming the clay pattern 1, I place, in the position of the eyes, balls 2 of a size corresponding to the eyeballs 1 of the finished head, shaping the pattern thereabout, as shown in Fig. 1. The balls 2 may be made of any suitable material, including wood, metal, and synthetic materials.

From the image or pattern 1, I then form a split plaster of paris mold 3; and when the mold has been formed from the pattern the mold has two internal spherically concave areas 3' therein corresponding to the surface of the eyes in the pattern. To these concave areas 3', I cement two plaster of paris balls 4 of the same size as balls 2. Balls 4 constitute cores for the eye sockets 6, in the head 5 to be cast in the mold.

To cast a distortable and flexible puppet head from the mold 3, the mold is inverted from the position shown in Fig. 2 and is then filled with latex. The latex is allowed to stand until a sufficient quantity thereof has congealed upon the inner surface of the mold to constitute the rubber skin of head 5, having the desired thickness. The uncongealed latex remaining after the skin has formed is then poured out of the mold; and after the skin, if of self-vulcanizing character, has sufficiently solidified, or if not, after it has been vulcanized, the rubber skin is stripped from the mold. In removing the skin from the mold the elasticity of the rubber permits it to stretch enough for the socket portions 6 to be pulled from the socket cores 4. The puppet head

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is thus provided with integral spherical eye sockets 5 adapted to receive the eyeballs that are to be inserted therein.

While for most purposes I prefer to use a split mold as shown in Fig. 2, I may, in lieu thereof, use a one-piece mold prepared in any suitable way known to the art. Since the rubber skin is collapsible, it lends itself to stripping from a one-piece mold; and to loosen the skin from the mold, jets of compressed air may be projected between the skin and the mold.

By the term "rubber" I do not limit myself to natural rubber, but refer to all artificial or synthetic rubbers as well as substitutes therefor.

Each socket 6 is of such size as to exert elastic tension on the inserted assembly of eyeball and lid. Thus, the socket exerts a slight constrictive grip upon the eyeball and eyelid, and both the eyeball and eyelid are thereby frictionally restrained to maintain any position into which they may be manually adjusted.

The eyeball 7, is a sphere colored or painted to resemble a natural eyeball, with a pupil 8 and an iris 9. Through the pupil a radial hole 10 is drilled extending partially, but not entirely through the sphere. This hole constitutes a socket into which an eye-adjusting tool such as a pin 11 may be inserted to enable turning the eyeball to various positions in the socket, such as indicated in Fig. 8. Since the hole 10 does not extend entirely through the eyeball, the inserted end of the pin or other instrument cannot come into contact with the lid or socket wall and thus interfere with the free movement of the eyeball. The hole 10 is ordinarily imperceptible because of its concentricity with the pupil, which is usually dark in color.

The eyelids 12 illustrated in Figs. 7, 8 and 9 have proven well adapted to the wear and tear of puppet use in stop motion technique wherein hundreds, and even thousands, of changes in eyelid position may be required of a single puppet employed in the enactment of a single drama. Each eyelid is composed of two hemispherical shells, 14 and 15, between which are held the ends of the lash-constituting filaments 13.

The layers 14, 15 of the lid may be secured together in any way as by cementing. The eyelash filaments 13 are first disposed in spaced relation along what will constitute the exposed forward edge thereof and are cemented down in this arrangement. The second shell 15 is then cemented onto the lashes 13 and the first shell 14, thus forming a two-ply lid with eyelashes which appear to grow out from its very edge. The filaments for the lashes may consist of metal, fiber, plastic, natural hair, textile fringe, or other material suitable for the particular purposes and effects contemplated.

Where eyelids of great durability are desired, the shells 14, 15 may be constructed of drawn copper or brass and the lashes 13 may be formed of fine Phosphor-bronze wire terminally secured between the shells by sweat soldering in the manner depicted in Fig. 8. Such nested metallic shells 14, 15 may be readily simultaneously drawn from flat stock by placing the sheet metal blanks 18, 19 therefor upon a block 16 of lead and forcing a hardened steel ball 17 into the blanks and block, as indicated by Fig. 9. The ball 17 may be so forced by means of hammer blows or by means of a press. After the drawing operation, the substantially hemispherical shells 14, 15 are cut out from the blanks 18, 19 and are trimmed and polished to remove rough spots and sharp edges

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which might tend to abrade the eyeball 7 or eye-socket 6.

A simpler eyelid structure may be produced through the use of a single shell 114 to the extreme edge portion of which lashes 113 are secured in a row of suitable extent by solder or cement. This shell 114, like those 14, 15 for the two-ply lid may, if desired, be formed by procedure other than drawing—for example by molding, casting or spinning methods.

To install the eyes and lids in the eye sockets 6 of the rubber head, the lid 12 or 112 is first placed upon the eyeball 7 as indicated in Figs. 7 and 8. This assembly is then forced into the eyesocket 6 by stretching its opening. Installed, the eyeball and lid takes on the lifelike appearance shown in Fig. 4.

To adjust the position of each eyeball 7, a pin 11 may be temporarily inserted into the drilled pupil hole 10 thereof, which pin may then be employed as a lever by which the eye may be readily turned to any selected position. To move the eyelid to any desired degree of closure, independent of the pupil position, the lashes 13 may be grasped by the fingers of the operator and used as a handle. It will be understood, thus, that independent adjustments of the eyeball and eyelid are possible in an infinite variability enabling the simulation of all "natural" eye effects indicative of human and animal emotions.

The rubber of socket 6 takes a relatively strong frictional hold on both the eyeball 7 and the lid 12 or 112. On the other hand, the friction between the eyeball 7 and the eyelid can be limited to a relatively small value, these parts being made of metal or like material. Thus, the eyeball and the eyelid can each be independently adjusted, without the adjusted eyeball position being disturbed by adjustive movement of the eyelid, and vice versa.

Having thus fully described my invention in compliance with the patent statutes, what I claim is:

1. A puppet head having an elastically expandible spherical eye socket provided with an eye opening in the puppet face, an eye-simulating ball member rotatably disposed within said spherical socket, snugly frictionally engaged by the elastic wall thereof and having the pupil-simulating portion of its surface exposed through said opening, and an eyelid member comprising a thin shell of spherical curvature complementarily interposed between said ball member and said socket, having greater surface area than said opening and lesser surface area than the spherical wall of said socket and having a higher coefficient of friction with said socket wall than with said ball member so as to enable independent selective adjustment of said shell and said ball member with respect to said socket.

2. A puppet head having an elastically expandible spherical eye socket provided with an eye opening in the puppet face, an eye-simulating ball member rotatably disposed within said spherical socket, snugly frictionally engaged by the elastic wall thereof and having the pupil-simulating portion of its surface exposed through said opening, an eyelid member comprising a thin shell of spherical curvature complementarily interposed between said ball member and said socket, having greater surface area than said opening and lesser surface area than the spherical wall of said socket and having a higher coefficient of friction with said socket wall than with said ball member so as to enable inde-

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pendent selective adjustment of said shell and said ball member with respect to said socket, said ball member being provided with a bore substantially coincident with a radius through the pupil-simulating portion of the surface thereof exposed by said opening for reception of a lever to effect rotative adjustment of said ball member relative to said eye socket, and eye-lash simulating means on the forward edge of said shell, extending through said opening and having sufficient extent and attachment thereto to enable use as a lid-adjusting instrumentality.

3. A puppet head having an elastically expandible spherical eye socket provided with an eye opening in the puppet face, an eye-simulating ball member rotatably disposed within said spherical socket, snugly frictionally engaged by the elastic wall thereof and having the pupil-simulating portion of its surface exposed through said opening, an eyelid member comprising a thin laminated shell of spherical curvature complementarily interposed between said ball member and said socket, having greater surface area than said opening and lesser surface area than the spherical wall of said socket and having a higher coefficient of friction with said socket wall than with said ball member so as to enable independent selective adjustment of said shell and said ball member with respect to said socket, and means for effecting said independent selective adjustment of said eyelid comprising eyelash-simulating means terminally interposed between and secured to lamina of said shell and extending through said socket opening in the puppet face.

4. In a puppet head, a spherical puppet eyeball having an eyelid comprising a part of a hollow sphere conforming to said eyeball and mov-

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able relative thereto, said eyeball and eyelid being mounted in a spherical socket and movable independently therein, both the eyeball and the eyelid being frictionally held in said socket against inadvertent movement.

5. A puppet head having a socket for a spherical eyeball, a movable spherical eyeball frictionally held against inadvertent movement in said socket, an eyelid comprising a portion of a hollow sphere conforming to said eyeball and to said socket and independently movable relative to said eyeball and to said socket, and means for manually moving both said eyeball and said eyelid relative to said socket.

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