Nov. 17, 1942. S. MARCUS 2,302,041

FLEXIBLE DOLL HEAD WITH EYES

Filed June 25, 1938

FIG. 1.

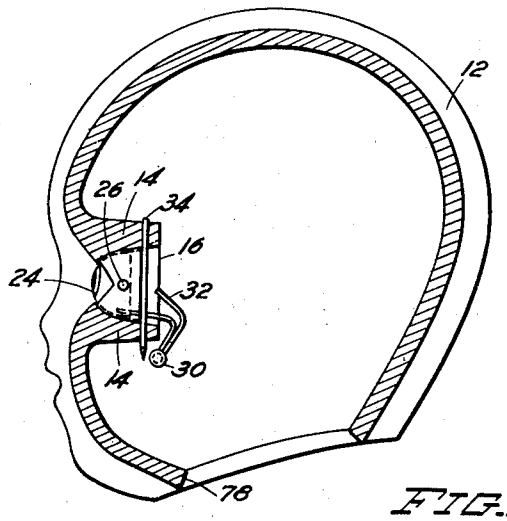


FIG. 2.

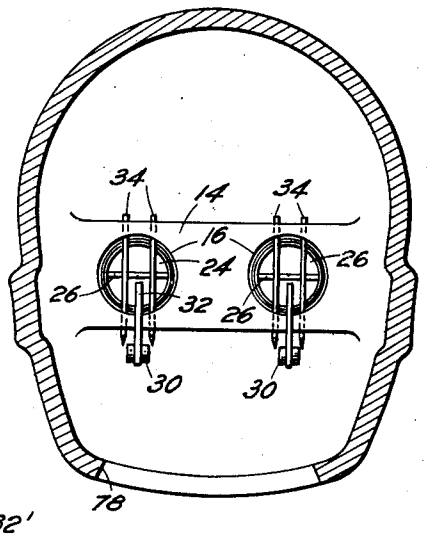


FIG. 3.

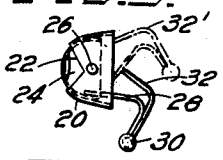


FIG. 5.

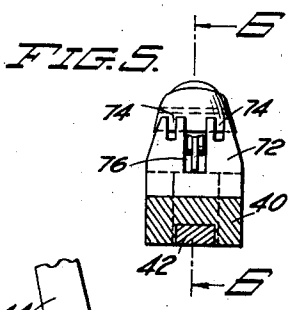


FIG. 7.

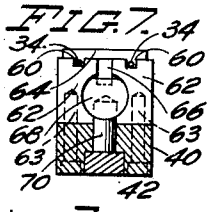


FIG. 6.

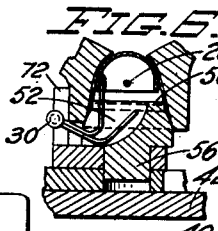
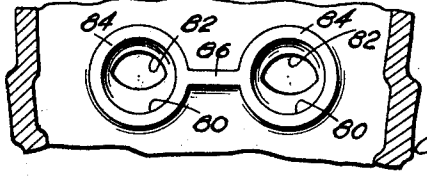


FIG. 4.

FIG. 8.

FIG. 9.



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FLEXIBLE DOLL HEAD WITH EYES

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Application June 25, 1938, Serial No. 215,777

7 Claims. (Cl. 46—169)

This invention relates to dolls, and more particularly to flexible doll heads provided with eyes, especially moving or sleeping eyes.

The primary object of my invention is to generally improve movable eyes for rubber doll heads and to improve the mechanism and method for mounting the same in the head.

Numerous plans have been proposed for mounting a facial accessory, such as a mouth member, or doll eyes, in flexible rubber heads, but none has proved fully satisfactory. In some, it is proposed to vulcanize a metal stiffening and support members in the rubber head at the eye openings, but this proves difficult because a large number of heads are molded at once in a single large mold, and a corresponding large number of the metal support members must all be placed just right in the many mold cavities. It has also been proposed to provide rearwardly or inwardly projecting walls at the eye openings, which walls form housings or sockets for receiving eye assemblies. It has been difficult, however, to hold the eye assembly securely within such a housing or socket. The difficulty is aggravated by the deformability of the rubber head. It is difficult to get the eye assembly into position, thus substantially increasing the manufacturing cost of the head.

Some of the objects of my invention are to overcome the foregoing difficulties, and to provide mounting mechanism for a facial accessory, which mechanism is simple, inexpensive, convenient, and rapid in use, and which is adaptable to variations in dimension and shape of the molded head. Further objects are to improve the eye assembly itself; to provide attaching means adapted for rapid operation with the aid of a suitable bench tool or machine; to provide means whereby the position of the eye may be adjusted within the head before locking the same in position; to provide a mounting in which the natural elasticity of the rubber material of the head is itself taken advantage of to provide a secure grip on the eye assembly; and to provide a mounting which may be opened up for removal of the eye assembly should it become necessary or desirable to repair or replace the same.

The method of mounting the eye assembly in the doll head, as well as the apparatus for practicing the method, are not claimed herein, the said subject matter being disclosed and claimed in my co-pending application Serial No. 413,921, filed October 7, 1941, which application is a continuation-in-part of the present application.

To the accomplishment of the foregoing and such other objects as will hereinafter appear, my invention consists in the doll head, doll eye, and mounting elements, and their relation one to the other, as hereinafter are more particularly described in the specification and sought to be defined in the claims. The specification is accompanied by a drawing, in which:

Fig. 1 is a section taken through a doll head in the plane of one of the eye members;

Fig. 2 is a transverse section across the head and shows the eye mechanism looking from the rear;

Fig. 3 is a side elevation of the eye assembly itself and is explanatory of the motion-limiting stop;

Fig. 4 is a partially sectioned side elevation showing the method of securing an eye assembly in the doll head;

Fig. 5 is a transverse section taken in the plane of the line 5—5 of Fig. 4;

Fig. 6 is a section taken in the plane of the line 6—6 of Fig. 5;

Fig. 7 is a section taken in the plane of the line 7—7 of Fig. 4;

Fig. 8 is a plan view of the eye supporting table of the attaching tool; and

Fig. 9 is explanatory of a modification of the head.

Referring to the drawing, and more particularly to Figs. 1 and 2, the doll head 12 is assumed made of a yieldable material, preferably vulcanized rubber, which is either left soft or only partially hardened so that it remains somewhat flexible and yieldable to the touch. These heads have proved to be popular because they better simulate the soft feel of natural flesh, but have caused great difficulty when attempting to improve the appearance of the head by providing the same with separately manufactured eyes, especially eyes of the moving or sleeping type. The head 12 has inwardly or rearwardly projecting walls 14 molded integrally therewith, and these walls define eye housings or sockets 16. In the present case, the sockets 16 are substantially cylindrical and are disposed immediately in back of the eye openings. The sockets may be made somewhat tapered or frustro-conical in configuration, thereby facilitating withdrawal of the molded head from the mold in which it is formed. The taper need not, however, be as great initially as that shown in the drawing, for the socket may be expanded somewhat by the eye assembly forced thereinto. In Fig. 2, it will be seen that in the present case the sockets 16 are formed in a substantial solid bridge of rub-

ber material extending across the front wall of the head. As will later appear, this is not essential and the walls 14 surrounding the sockets may be merely cylindrical, but the arrangement of Figs. 1 and 2 has the advantage of stiffening the head against excessive deformation in the immediate region of the eyes.

The nature of the eye assembly will be evident on referring to Fig. 3. The assembly comprises a sheet metal outer shell 20 which is open at the rear and which is cut away at the front to form an eye opening 22 which conforms generally to the eye openings in the doll head. The opening 22 may be, however, and preferably is made slightly larger than the opening in the doll head in order not to unnecessarily expose the edges of the metal outer shell 20. Of course, the opening 22 is not made much larger than the eye opening, for it must be remembered that the primary function of the outer shell is to provide a rigid protective housing around the eye member 24, with a certain amount of clearance therebetween to ensure free oscillation of the eye member. The opening 22 must, therefore, not be made so large as to permit the rubber eye opening to engage and rub frictionally against the eye 24, because this would obstruct the desired free oscillation.

The eye member 24 may be of conventional character. It is approximately hemispherical in configuration, and in the present case is shown in simplest form, but it will be understood that the eye member may, if desired, be elaborated to include a lens or an eyelash, or both. The eye member is oscillatably mounted on a pivot rod 26 which extends transversely across the eye assembly, the ends of pin 26 being received in the side walls of the outer shell and the eye member turning freely on pivot 26. It will be noted that the outer shell is rearwardly divergent. This facilitates drawing the metal to the desired cup-shape, and it also ensures the provision of adequate clearance around the eye member 24 during oscillation of the same.

The eye member is completed by means of a control arm 28 extending rearwardly therefrom. Control arms from both eyes may, if desired, be connected to a single weight, but in the present case I provide each eye with its own individual weight. The forward end of arm 28 is spot-welded to the inside of the eye member at the bottom of the eye. Arm 28 is bent, as shown in Fig. 3, and may be provided with a small weight 30. The opening movement of the eye is limited by contact of arm 28 with the bottom of the outer shell 20 or with the rubber socket receiving the same. The closing movement of the eye is limited by means of a special stop arm 32 which projects upwardly from weight 30 and is so positioned as to engage the top of the outer shell (or the socket) when the eye is closed. This is indicated by the change from the solid line position of Fig. 3 to the broken line position 32'.

I find that the weight arm and stop arm may be conveniently made out of an ordinary inexpensive cotter pin of appropriate size. The longer arm of the cotter pin is used for weight arm 27 and the shorter arm is bent to act as the stop arm 32. The head or eye of the cotter pin acts as a weight and this may be increased, as shown, by squeezing a bit of soft lead rod through the head, the ends being upset or riveted as shown, thus providing the weight 30.

Reverting now to Figs. 1 and 2, it will be seen that the eye assembly is held in the socket by simply driving one or more pins 34 through the socket walls and across the socket immediately behind the eye assembly. I prefer to use two such pins, these being disposed vertically in spaced relation on opposite sides of the weight arm so that there is no interference with free oscillation of the weight and stop arms. The pins 34 are inexpensive yet function to hold the eye assemblies securely in position. If the pins are so driven as to place the socket walls under tensile stress, the eye assemblies are urged tightly forwardly against the eye openings and against the socket walls, thus effectively preventing any movement thereof.

The eye assemblies are preferably mounted in place with the aid of a tool, such as that shown in Figs. 4 through 7 of the drawing. Referring to those figures, the tool comprises a base 36 carrying a pedestal 38 which in turn carries a horizontally disposed arm 40. The underside of arm 40 is channeled to receive a slide bar 42 which is slidable longitudinally of the stationary arm 40. Slide bar 42 may be reciprocated by means of an operating handle or lever the lower part of which is shown at 44, said lever being pivoted at 46 on pedestal 38 and being connected to slide bar 42 by means of a pivoted link 48.

Arm 40 carries a miniature circular table 50 which is dimensioned to receive the eye assembly with the eye facing upwardly, as is clearly shown in the drawing. The upper face of the table is cut away at 52 to receive the weight arm, as is best shown in Figs. 6 and 8. It is also slotted at 54 to permit passage of the attaching pins. Table 50 is secured to arm 40 by means of a dowel connection 56, but functionally the table is fixedly secured to the arm and may be considered as though made integrally with the arm.

The pins 34 are preliminarily placed in channels or guides 60 which are formed on the upper surface of a guide block 62 which really consists of two separate sides or blocks fixedly secured to the free end of arm 40, as by means of screws 63 (Fig. 7). The pins are driven through the socket walls by means of a pin pusher 64 which is a generally T-shaped member having lugs depending from the cross-arm of the T, said lugs riding in the channels 60 behind the blunt or head end of the pins. The stem 66 of the T-shaped member is received in a slot formed between blocks 62, said slot communicating with a cylindrical guide space in which a cylindrical pusher guide 68 is slidable. The stem 66 of the T-shaped pusher is secured to the cylindrical pusher guide 68, and the latter is in turn connected to the slide bar 42 by means of a dowel connection 70. On inspection of Fig. 4, it will be evident that by pulling the lever 44 in a counter-clockwise direction, the slide bar 42, the pusher guide 68, and the pin pusher 64 are all moved to the left, thus driving the pins 34 through the rubber socket walls. The pins pass through the channels 54 at the top of the table 50, and the table receives the eye assembly in such relation to the pins that the pins are driven immediately beneath the rear or open edge wall of the eye assembly.

To support the lower wall of the socket from moving away from the eye assembly when the pins reach the same, the tool is provided with a support wall 72, best shown in Figs. 4, 5, and 6. This support wall is recessed at 74 to pass the pins and is also cut away at 76 to receive the weight arm. It will be seen from inspection of Figs. 4 and 6 that the socket wall is received

snugly between the eye assembly and the support wall **72**, and is thereby held against movement when the pins **34** are being driven therethrough.

In actual operation, the procedure is as follows. An eye assembly is mounted on table **50**. A pair of pins are laid in the guide channels **60** with the points directed toward the eye assembly. The neck opening **78** of the doll head is then placed over the free end of the tool until the eye opening comes above the eye assembly, whereupon the head is pressed firmly downwardly to force the eye socket about the eye assembly. The eye is exposed in the eye opening because the weight arm is supported against the normal eye closing movement, by the tool. The eye may, therefore, be inspected to see if it is properly located with respect to the eye opening. If it is not properly located, the head is tilted somewhat or is swung laterally about the eye assembly, as may prove necessary to properly locate the eye in the eye opening. It is important at this time that the eye assembly be prevented from turning with the head. A special notch or recess may be cut in the outer shell of the eye and the table **50** may be provided with a key passing into such a recess in order to hold the parts in registration. It is also possible to have arms passing upwardly from the table and receiving the pivot rod **26** of the eye assembly. In the present case, rotation of the eye assembly relative to support arm **40** is prevented by the weight arm of the eye, this being received in the recess **52**, as is shown in Figs. 6 and 8.

As soon as the eye is properly registered with respect to the eye opening, and while pressing the head firmly downwardly about the eye assembly, the operating lever **44** is pulled, thus driving the pins **34** across the socket in back of the eye assembly. The relation of the parts is such that the pins are received tightly against the rear edge of the eye assembly, and the fit of the eye assembly in the socket is made a tight one by reason of the elasticity of the rubber socket walls, for these walls are pushed downwardly somewhat more than normal when the pins are driven, and thereafter hold the eye assembly under tension between the eye opening at the front, and the pins at the back.

In Figs. 1 and 2, the sockets **16** are formed in a solid bridge or web of rubber which stiffens the front wall of the head in the region of the eye openings. It will be understood that this is not at all essential for practice of the invention, and that the socket walls may, if desired, be limited to comparatively thin, uniform walls surrounding and defining the sockets. This is illustrated in Fig. 9, in which the sockets **80** are disposed immediately in back of eye openings **82** and are defined by substantially cylindrical walls **84** projecting inwardly from the front wall of the doll head. The walls **84** are connected by a cross-wall **86**, but even this wall is not essential for practice of the present invention.

It is believed that the doll head and doll eye construction of my invention, as well as the method of attaching the eyes within the head, and the many advantages thereof, will be apparent from the foregoing detailed description. An incidental further advantage of the present invention is that the eye can be removed and replaced if it appears defective after insertion. The operator pulls the pins out with pliers, and then pushes the eyes inwardly through the eye openings. The mounting operation may then be repeated.

It will be apparent that while I have shown and described my invention in preferred forms, many changes and modifications may be made without departing from the spirit of the invention defined in the following claims.

I claim:

1. In combination, a doll head made of relatively soft material and having a facial opening, said head being molded with inwardly directed walls at the opening, a device simulating a facial characteristic inserted between said walls and exposed at the opening, and means holding said device snugly within the walls, said means comprising one or more pins driven through the walls and extending across the device.

2. In combination, a doll head made of relatively soft yieldable material and having eye openings, said head being molded with inwardly directed walls around the eye openings defining sockets projecting rearwardly from the eye openings, an eye assembly inserted in each socket, and means holding said assembly snugly within the socket, said means comprising one or more pins driven through the socket walls and extending across the socket.

3. In combination, a doll head made of rubber and having eye openings, said head being molded with integral inwardly directed walls at the eye openings defining approximately cylindrical sockets projecting rearwardly from the eye openings, an eye assembly inserted in each socket, said eye assembly comprising an outer shell dimensioned to fit snugly into the socket and having an opening at the forward end conforming to the eye opening in the doll head, and an eye member oscillatably mounted within said outer shell, and means holding said assembly snugly within the socket, said means comprising a plurality of pins driven through the socket walls and extending across the socket immediately behind the outer shell.

4. In combination, a doll head made of rubber and having eye openings, said head being molded with inwardly directed walls at the eye openings defining sockets projecting rearwardly from the eye openings, an eye assembly inserted in each socket, said eye assembly comprising an outer shell having an opening at the forward end conforming to the eye opening in the doll head, an eye member oscillatably mounted within said outer shell, and a weight arm extending rearwardly from the eye member, and means holding said assembly within the socket, said means comprising a plurality of pins driven through the socket walls immediately behind the outer shell, said pins being disposed vertically on each side of the weight arm.

5. In combination, a doll head made of rubber and having eye openings, said head being molded with inwardly directed walls at the eye openings defining sockets projecting rearwardly from the eye openings, an eye assembly inserted in each socket, said eye assembly comprising an outer shell having an opening at the forward end, an eye member oscillatably mounted within said outer shell, and a weight arm extending rearwardly from the eye member, said weight arm being so shaped that it cooperates with the outer shell to limit the permitted range of movement of the eye member, and means holding said assembly within the socket, said means comprising one or more pins driven through the socket walls immediately behind the outer shell in such a position as not to interfere with the operation of the weight arm.

6. A single doll eye assembly for individual use in one eye opening of a rubber head, said assembly comprising an approximately cylindrical outer shell open at the rear end and cut away at the front to conform to an eye opening, an eye member within said outer shell, a pivot extending across said outer shell from one side wall to the opposite side wall of said outer shell and through said eye member, and an arm for said eye member, said arm comprising a reversely bent piece of wire having one leg bent with its free end secured to the wall of the eye member to form a motion-limiting stop for bearing against the outer shell and so limiting opening movement of the eye member, and its other leg differently bent to form a motion-limiting stop for bearing against the outer shell and so limiting the closing movement of the eye member.

7. In combination, a doll head made of rubber and having eye openings, said head being molded with inwardly directed walls at the eye openings defining approximately cylindrical sockets projecting rearwardly from the eye openings, an eye assembly inserted in each socket, each eye assembly comprising an outer shell having an opening at the forward end, an eye member oscillatably mounted within said outer shell, a weight arm extending rearwardly from the bottom wall of the eye member and bent downwardly, and a weight secured to the lower end of the weight arm, and means holding said assembly securely within the socket, said means comprising two pins driven through the socket walls immediately behind the outer shell, said pins being disposed vertically at each side of the center of the rear edge of the outer shell with the weight arm freely movable in the space therebetween, the rearwardly extending part of said weight arm bearing against a part of the outer shell and thereby acting as a motion-limiting stop to limit the opening movement of the eye member.

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