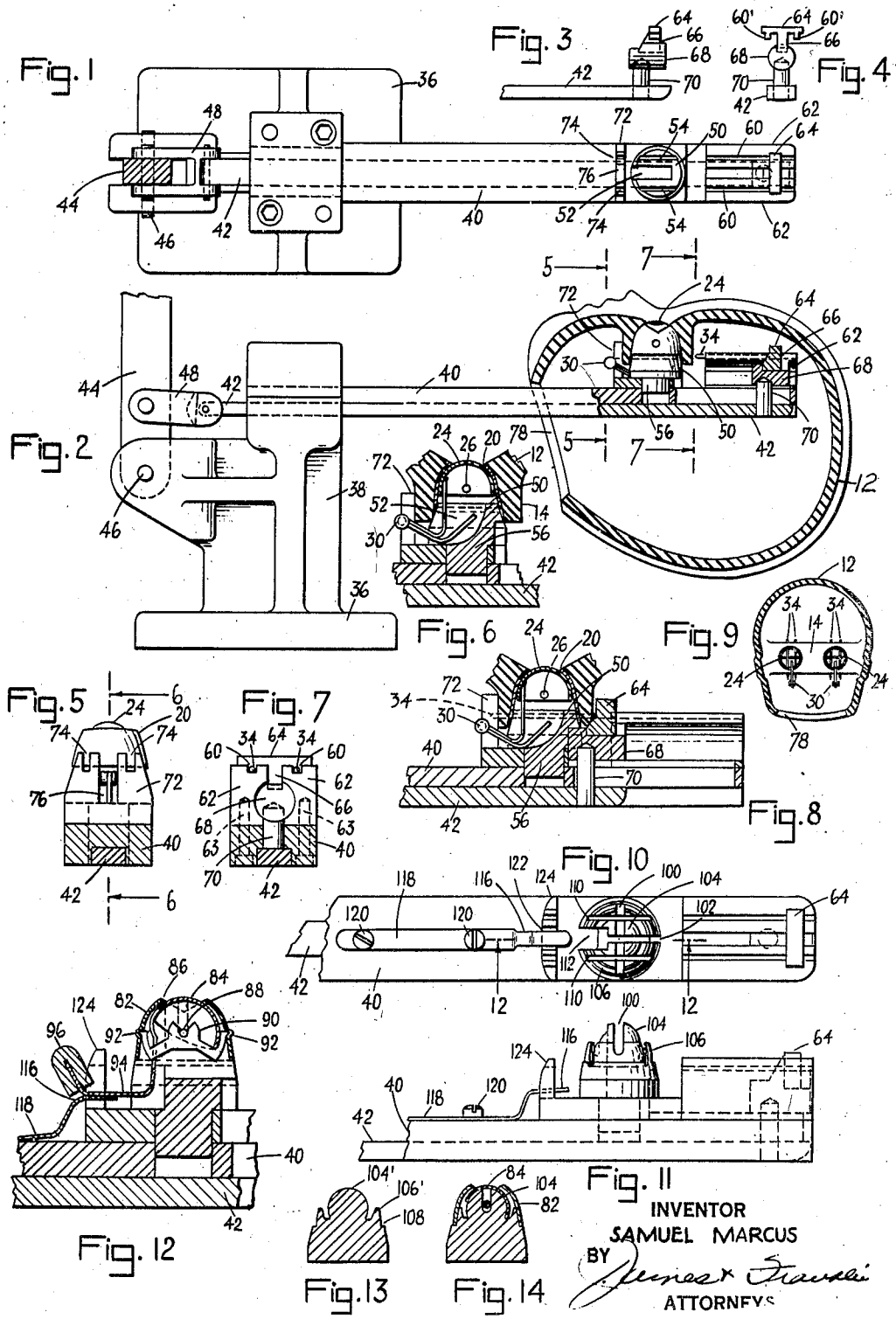
Jan. 18, 1944. S. MARCUS 2,339,342

APPARATUS FOR MOUNTING EYES IN DOLL HEADS

Filed Oct. 7, 1941



Patented Jan. 18, 1944

2,339,342

UNITED STATES PATENT OFFICE

2,339,342

APPARATUS FOR MOUNTING EYES IN DOLL HEADS

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Application October 7, 1941, Serial No. 413,921

11 Claims. (Cl. 1—1)

This invention relates to doll eyes, and more particularly to an apparatus for mounting the same in doll heads, especially rubber heads.

The primary object of my invention is to generally improve the manufacture of dolls and more particularly the mounting of doll eyes in doll heads. The present application is a continuation-in-part of my co-pending application Serial Number 215,777, filed June 25, 1938, and entitled "Flexible doll head with eyes."

Some of the objects of my invention are to provide an apparatus for mounting a facial accessory, which is convenient and rapid, and adaptable to variations in dimension and shape of the molded head. Further objects are to make it possible to adjust the position of the eye within the head before locking the same in position; 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.

To the accomplishment of the foregoing and such other objects as will hereinafter appear, my invention consists in the apparatus 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 partially sectioned plan view of an apparatus for practicing the present invention;

Fig. 2 is a partially sectioned elevation of the same;

Fig. 3 is an elevation of the movable part of the apparatus;

Fig. 4 is an end elevation of the movable part shown in Fig. 3;

Fig. 5 is a section taken approximately in the plane of the line 5—5 of Fig. 2;

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

Fig. 7 is a section taken approximately in the plane of the line 7—7 of Fig. 2;

Fig. 8 is a section similar to Fig. 6, but showing the relation of the parts at the end of the pin driving stroke;

Fig. 9 is a section through a doll head showing the eyes mounted at the front of the head;

Fig. 10 is a plan view showing the working portion of a slightly modified apparatus;

Fig. 11 is an elevation of the same;

Fig. 12 is a section taken approximately in the plane of the line 12—12 of Fig. 10, but with an eye assembly in position;

Fig. 13 is a schematic section explanatory of the construction of the support seat of the apparatus; and

Fig. 14 is a schematic section explanatory of the method of supporting the eye assembly.

The nature of the doll head and the construction of the eye assembly are described in detail and claimed in my copending parent application Serial No. 215,777, previously referred to. Only a very brief description will therefore be given here.

Referring to the drawing, and more particularly to Figs. 6 and 9, the doll head 12 is assumed made of a yieldable material, preferably rubber. The head 12 has inwardly or rearwardly projecting walls 14 molded integrally therewith, and these walls define eye housings or sockets.

The nature of the eye assembly will be evident on referring to Fig. 6. 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 which conforms generally to the eye openings in the doll head.

The eye member 24 may be of conventional character. It is approximately hemispherical in configuration. The eye member is oscillatably mounted on a pivot rod 26 which extends transversely across the eye assembly, the ends of pivot 26 being received in the side walls of the outer shell, and the eye member turning freely on pivot 26.

The eye member is completed by means of a control arm extending rearwardly therefrom. The forward end of the arm is spot-welded to the inside of the eye member at the bottom of the eye. The arm is bent, as shown in Fig. 6, and may be provided with a small weight 30.

Referring now to Figs. 8 and 9, 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 arm. 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. 1 through 8 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 or seat 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. 1 and 6. It is also slotted at 54 (Fig. 1) to permit passage of the attaching pins. Table or seat 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 (Figs. 1 and 7) 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 34 are driven through the socket walls by means of a pin pusher 64 which is a generally T-shaped member having lugs (60' in Fig. 4) 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. 2, it will be evident that by pulling the lever 44 in a counterclockwise 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. 1, 2, 5, and 6. This support wall is recessed at 74 (Figs. 1 and 5) to pass the pins, and is also cut away at 76 to receive the weight arm. It will be seen from inspection of Figs. 2 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 the seat or 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.

The tool as so far described is intended particularly for use with a simple "sleeping" eye. Both the eye and the tool shown correspond to those disclosed in my earlier co-pending parent application Serial Number 215,777, previously referred to. In fact, Figs. 2, 5, 6, 7, and 9 of the drawing described above, are reproductions of Figs. 4, 5, 6, 7, and 2, respectively, in said parent application, while the seat portion at the right-hand end of Fig. 1 in the present case corresponds to Fig. 8 in the aforesaid parent application.

Figs. 10, 11, and 12 illustrate a slight modification of the invention adapted to receive a so-called "rolling" eye. This modified tool will also accommodate the more simple "sleeping" eye previously referred to. A section through the rolling eye is shown at the upper part of Fig. 12, it comprising an outer shell 82 protectively enclosing an eye member 84 which is exposed through an eye opening 86 in the forward part of the outer shell 82. The eye member 84 is carried on a horizontal shaft 88 the ends of which terminate at the eye member 84 and do not pass through the outer shell 82. Instead, shaft 88 is carried at its middle by a normally upright sheet metal bearing member 90, the ends of which form pivots which are received in mating bearings 92. The member 90 is shaped somewhat like an E or "sigma." A weight arm 94 is formed integrally with eye 84, and carries a weight 96 at its lower end. The weight arm is longitudinally slotted to receive the bearing member 90. The arrangement is such that weight 96 functions not only to open or close the eye about the horizontal shaft 88, but also to roll it to one side or the other about a vertical axis extending through the bearings 92.

The seat for the eye assembly shown in Figs. 1 and 2 may not be suitable for receiving the rolling eye assembly, because no provision is made to receive the bearing member 90. In Figs. 10, 11, and

12, it will be seen that the seat has been cut through by a transverse slot **100** which is adapted to receive the cross-rod **88**, and further, that it has been cut through by a slot **102** extending longitudinally of the arm **40** and adapted to receive the bearing member **90**. The transverse slot is useful even with the "sleeping" eye, as it receives the shaft **26** previously referred to. With either eye this helps prevent any change in the orientation of the eye while positioning the head thereover.

The modified seat also differs from that previously described in providing a support for the eye independently of the support for the outer shell. Specifically, the eye is received on a spherically surfaced support **104** (Figs. 10 and 11), while the outer shell is received over a flange or skirt-like portion **106**. The underlying idea will be clear from inspection of Figs. 13 and 14. In Fig. 13 it is assumed that the seat has been turned to shape, but has not yet been cut through by the necessary slots. In such case, the seat comprises a partly spherical portion **104'** to receive the eye member, and a skirt portion **106'** with a step **108** to receive the outer shell. The seat is then cut through by appropriate slots. If the seat is to be used only with a sleeping eye of the character first set forth, the seat may be provided with the two slots **110** extending longitudinally of arm **40** to receive the nails or pins, and if the eye assembly employs a cross-rod, such as the rod **26**, the seat is also provided with the transverse slot **100** previously referred to. The parts will then be seated as is schematically indicated in Fig. 14. The seat is preferably further cut away at **112** (Fig. 10) to receive the weight arm of the eye member. If the seat is to be used with a rolling eye as well as a sleeping eye, the additional slot **102** (Fig. 10) is preferably provided to receive the E-shaped bearing member. The schematic showing in Fig. 14 of the partially completed seat, better clarifies how the eye member **84** may be supported independently of the support provided for the outer shell **82**. This independent support helps prevent possible injury or relative displacement of the eye and the outer shell.

Another change or modification illustrated in Figs. 10, 11, and 12, is the provision of a relatively light leaf spring **116**, the stationary end **118** of which is secured to the top of arm **40**, as by means of screws **120**. The movable end **116** is receivd in the middle slot **122** of support wall **124**. This spring provides a yieldable support for the weight arm, the latter resting thereon as shown in Fig. 12. The spring is so located as to hold the eye in desired position, yet will readily yield downwardly if the head is pressed downwardly over the eye assembly far enough to reach and bear downwardly on the weight arm.

It is believed that the apparatus of my invention for mounting doll eyes in rubber heads, as well as the many advantages thereof, will be apparent from the foregoing detailed description. The eyes may be inserted in the head securely and rapidly and may be properly positioned just before securing the same in position. Appropriate means is provided to support the weight arm and thereby keep the eye looking in desired direction. The head may be turned slightly from side to side in order to properly orient the eye in the head, without accompanying orientation of the eye, it being held by appropriate means bearing against the weight arm, or the cross-rod, or both. The pins employed to hold the eyes in position are inexpensive, yet provide a very secure mounting. If necessary, they may be removed by the use of pliers, thus affording the possibility of repair or replacement of the eye. The apparatus is so designed that the eyes may be mounted through the neck opening of the head.

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

I claim:

1. Apparatus for mounting a facial accessory in a doll head, said head being molded with inwardly projecting walls in back of the opening which is to receive said accessory, said apparatus comprising a seat shaped and dimensioned to receive and support the accessory in order to facilitate inserting the accessory between the said walls from the rear until the accessory is properly located with respect to the opening, guide means to support one or more pins adjacent one of the walls, and driving means to drive the pins through the walls transversely across the accessory in order to anchor the accessory in position.

2. Apparatus for mounting eye assemblies in a doll head, said head being molded with eye sockets in back of the eye openings, said apparatus comprising a seat shaped and dimensioned to receive and support the eye assembly while inserting the same into the socket from the rear, pin guides to support one or more pins adjacent the socket walls, and driving means to drive the pins through the socket walls transversely across the socket immediately behind the eye assembly.

3. Apparatus for mounting eye assemblies in a doll head, said head being molded with walls defining sockets in back of the eye openings, said apparatus comprising a seat shaped and dimensioned to receive and support the eye assembly with the eye looking up, pin guides to receive and support one or more pins in horizontal position pointed toward the side of the eye assembly at the bottom edge thereof, said apparatus being relatively slender in shape so that the doll head may be placed thereover and pressed downwardly until the socket is pushed firmly over the eye assembly, and driving means for moving the pins longitudinally and thereby driving the pins through the socket walls transversely across the socket immediately behind the eye assembly.

4. Apparatus for mounting doll eyes in a doll head having deep socket walls behind the eye openings, said apparatus comprising a stationary seat for receiving and supporting an eye assembly with the eye looking upwardly, channels or guides for pins disposed at one side of the seat, a pin pusher slidable in said channels for bearing against the outer ends of the pins and forcing the pointed inner ends through the socket walls at the eye assembly, an arm supporting the aforesaid parts, a base to which the support arm is secured, an operating lever, and a connection between the operating lever and the pin pusher, whereby operation of the lever causes the pins to be driven through the socket walls in order to hold the eye assembly in the doll head.

5. Apparatus for mounting doll eyes in a doll head having deep socket walls behind the eye openings, said apparatus comprising a stationary seat for receiving and supporting an eye assembly with the eye looking upwardly, channels or guides for pins disposed at one side of the seat, a pin pusher slidable in said channels for bearing

against the outer ends of the pins and forcing the pointed inner ends through the socket walls at the eye assembly, a support wall on the opposite side of the seat for supporting the opposite socket wall against movement when the pins are thrust therethrough, an arm supporting the aforesaid parts, a base to which the support arm is secured, an operating lever, and a connection between the operating lever and the pin pusher, whereby operation of the lever causes the pins to be driven through the socket walls in order to hold the eye assembly in the doll head.

6. Apparatus for mounting doll eyes in a doll head having deep socket walls behind the eye openings, said apparatus comprising a stationary seat for receiving and supporting an eye assembly with the eye looking upwardly, channels or guides for pins disposed at one side of the seat, said seat being vertically slotted to receive the pins and being additionally slotted to receive parts of the eye assembly, a pin pusher slidable in said channels for bearing against the outer ends of the pins and forcing the pointed inner ends through the socket walls at the eye assembly, an arm supporting the aforesaid parts, a base to which the opposite end of the support arm is secured, an operating lever, and a connection between the operating lever and the pin pusher, whereby operation of the lever causes the pins to be driven through the socket walls in order to hold the eye assembly in the doll head.

7. Apparatus for mounting doll eyes in a doll head having deep socket walls behind the eye openings, said apparatus comprising a stationary seat for receiving and supporting an eye assembly with the eye looking upwardly, stationary channels or guides for pins disposed at one side of the seat, said seat being vertically slotted to receive the pins, a pin pusher slidable in said channels for bearing against the outer ends of the pins and forcing the pointed inner ends through the socket walls at the eye assembly, a support wall on the opposite side of the seat for supporting the opposite socket wall against movement when the pins are thrust therethrough, a relatively slender support arm adapted to pass through the neck opening of a doll and supporting the aforesaid parts, a base to which the opposite end of the support arm is secured, an operating lever, and a slide bar extending along the support arm between the operating lever and the pin pusher, whereby operation of the lever causes the pins to be driven through the socket walls in order to hold the eye assembly in the doll head.

8. Apparatus as defined in claim 4, for use with an eye assembly having a weight arm, and further comprising means for supporting the weight arm of the eye in order to keep the eye in desired position during the eye mounting operation.

9. Apparatus as defined in claim 4, for use with an eye assembly having a weight arm, and further comprising a relatively light leaf spring for yieldably supporting the weight arm of the eye assembly in order to keep the eye in desired position.

10. Apparatus as defined in claim 4, for use with an eye assembly including an outer shell and an inner eye member, in which apparatus the seat includes an upper smaller portion for directly receiving and supporting the eye member, and a lower larger portion for receiving and independently supporting the outer shell.

11. Apparatus as defined in claim 4, for use with an eye assembly comprising an outer shell and an inner eye member having a weight arm, in which apparatus the seat includes an upper smaller portion for directly receiving and supporting the eye member, and a lower larger portion for receiving and independently supporting the outer shell, said apparatus further comprising a relatively light leaf spring for yieldably supporting the weight arm of the eye in order to keep the eye in desired position during the mounting operation.

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