

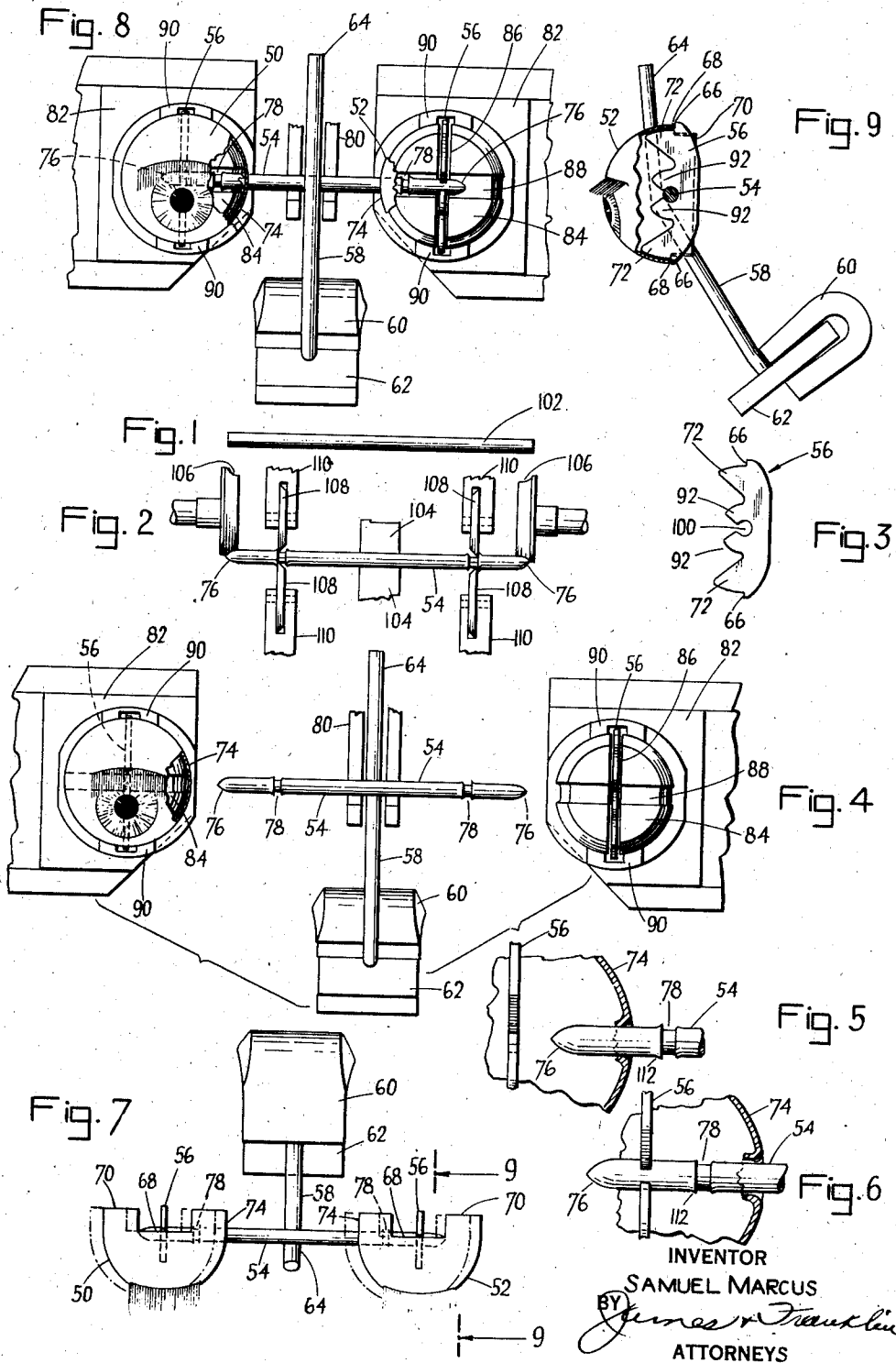
April 21, 1942.

S. MARCUS

2,280,245

MANUFACTURE OF DOLL EYE ASSEMBLY

Original Filed June 17, 1938



UNITED STATES PATENT OFFICE

2,280,245

MANUFACTURE OF DOLL EYE ASSEMBLY

Samuel Marcus, Jersey City, N. J., assignor to
Margon Corporation, Bayonne, N. J., a cor-
poration of New Jersey

Original application June 17, 1938, Serial No.
214,189. Divided and this application June 28,
1941, Serial No. 400,246

6 Claims. (Cl. 29—148.2)

This invention relates to the manufacture of doll eyes.

The objects of the invention center about the assembly of a pair of eyes on an appropriate cross-rod or eye shaft. This assembly is made inexpensive by the use of a key frictionally mounted on the cross-rod at each eye. Provision is made for manual rotative adjustment of one eye relative to the other, and for an automatic self-adjustment of the spacing between the eyes. The eye shells are perforated to receive the cross-rod, and the perforation is made over-sized to permit the desired free movement of the eye on the shaft. In accordance with a feature and object of the present invention, the usual separate operation for perforating the eye shell is eliminated, and the cross-rod is itself used to perforate the eye shell while mounting the eye on the cross-rod. In accordance with still another feature and object of the invention, the perforation is made over-sized, although produced by the cross-rod itself, by preliminarily scoring or otherwise treating the cross-rod near its ends to produce an upset ring of metal or enlargement on the cross-rod which in passing through the wall of the eye shell, enlarges the opening therein to insure a free fit.

To the accomplishment of the foregoing and other objects which will hereinafter appear, my invention consists in the method of manufacturing a doll eye assembly, as hereinafter 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 shows the cross-rod before it is operated on;

Fig. 2 illustrates the method of pointing the ends of the cross-rod, and forming raised ridges on the same;

Fig. 3 is a side elevation of a key which is frictionally received on the cross-rod;

Fig. 4 is a plan view schematically illustrating a first step in the method of impaling the eyes and keys on the cross-rod;

Fig. 5 is a fragmentary section showing an intermediate stage;

Fig. 6 is a similar fragmentary section showing the final stage;

Fig. 7 is a top view of a finished eyeset made in accordance with the invention;

Fig. 8 is a plan view illustrating the final stage in the operation of impaling the eyes on the cross-rod; and

Fig. 9 is a transverse section through the

eyeset looking in the plane of the line 9—9 of Fig. 7.

The present specification deals with the complete eyeset, that is, the assembly of a pair of eyes with a cross-rod and weight for operating the same. The eye itself is not described in detail, and may be of any specific character, one form being that shown and claimed in my co-pending parent application Serial No. 214,189, filed June 17, 1938, of which the present application is a division directed particularly to the assembly of the eyes with a cross-rod.

The eye assembly is shown in Figs. 7, 8 and 9, and comprises the eyes 50 and 52 mounted on the ends of the cross-rod 54 with the aid of keys 56, said cross-rod 54 having welded or otherwise secured thereto, a weight arm 58 carrying at its lower end a weight 60. This consists of a reversely bent piece of metal and carries a forwardly projecting piece of cardboard 62 which acts as a bumper striking the front wall of the doll head when the eyes move to open position. The upper end of the weight arm 58 may be extended as indicated at 64 to form a motion-limiting stop to limit the closing movement of the eye, just as the bumper 62 limits the opening movement of the eyes.

The eyes are caused to rotate with cross-rod 54 by means of the keys 56. These are received with a tight frictional fit on the cross-rod and are provided with shoulders 66 which bear against the rear edge of the eye shell. The latter is notched or cut away to receive the shoulders 66, as is best shown at 68 in Figs. 7 and 9. It is important that the eye be centered with respect to the cross-rod 54, and while the main rear edge 70 of the eye may vary somewhat in dimension and location, and may be rough or uneven, the recessed edges 68 at the top and bottom of the eye shell are located exactly in the plane of the center of the eye shell and mate correctly with the shoulders 66 of keys 56. It will be understood that the keys cause the eyes to turn with the shaft, and that the rotative position of the eyes on the shaft may be varied by manually turning the eye and key on the shaft. This permits adjustment of one eye relative to the other, and permits both eyes to be properly adjusted in the eye openings of the doll head while the weight of the eyeset is moved to its limiting position against the doll head. By means of this adjustment, the lashes may be caused to rest against the upper edges of the eye openings in the head when the eyes are open. The shape of the key 56 is most clearly shown

in Fig. 3, in which it will be seen that the hole 100 therein is open at one side, the hole being formed between separated projections or lugs 92. The benefit of this construction is that the hole may be made initially smaller than the diameter of the cross-rod, so as to receive the cross-rod with a tight frictional fit. This is more than adequate to turn the eyes with the cross-rod, yet the eyes together with the keys may be manually rotatively adjusted on the cross-rod to best fit the eye openings of the particular head in which the eyeset is being installed.

It has been mentioned that the shoulders 66 are located in the plane of the axis of the cross-rod or the hole 100, but it will be understood that it is not necessary for the shoulders to be located directly in the plane of the axis, it being sufficient if it is located in some fixed desired relation to the plane of the axis. In such case, the notches or recesses 68 of the eye shells should be correspondingly changed, so as to have the same fixed desired relation to the center of the eye shell, in order to properly mate with the shoulders 66.

In the present construction, the perforations through the side wall of the eye for receiving the cross-rod 54 are made over-sized to insure a loose fit of the eye on the cross-rod. Moreover, the notches 68 are made substantial in side to side dimension, as is clearly shown in Fig. 7. This permits a limited sideward movement of the eyes on the cross-rod, the limit of motion being determined by the inwardly projecting fingers 72 of the keys 56, which are made somewhat closer than the maximum dimension from top to bottom in the eye. In this way an automatic adjustment of the distance between eyes will take place so that the eyes will accommodate themselves to the eye openings in the doll head.

This is illustrated in Fig. 7 of the drawing, in which the solid line position of the eyes indicates the approximate mid-position or normal position of the same. The eyes may move outwardly relative to the mid-position, this being shown by the dot-and-dash outline in the left-hand part of Fig. 7. The eyes may also move inwardly relative to the mid-position, this being shown by the dot-and-dash outline in the right-hand part of Fig. 7. If the spacing between the eye openings of the doll head is less than usual, the eyes may move inwardly to fit the eye openings, and conversely, if the spacing between the eye openings is greater than usual, the eyes may move outwardly to accommodate the increased spacing.

In accordance with the present invention, the openings in the inner walls 74 of the eyes are made by the cross-rod 54. With this object in view, the ends of the cross-rod are preferably pointed, as shown at 76. A short distance in from the ends, the cross-rod is so treated as to form an enlargement or raised ring of metal therearound. In the present case this is done by simply scoring the cross-rod inwardly at 78, thereby displacing some metal outwardly at each side of the scoring 78. This scoring is located between the key 56 and the wall 74 of the eye, so that in forcing the cross-rod through eye, the enlargement is also forced through the wall of the eye, thus making the opening in the eye large enough to insure a free fit of the eye on the cross-rod.

The manner in which the cross-rod is pointed and scored, is schematically illustrated in Figs. 1

and 2. The cross-rod is initially a piece of plain round wire with sheared ends, as is indicated at 102 in Fig. 1. This may be gripped at the center between jaws 104 (Fig. 2) and the ends pointed by cutters 106. These cutters may rotate, and also revolve about the axis of rod 54, thus pointing the ends, as indicated at 76.

The ridges on the cross-rod may be formed by wheels 108 carried on bearings 110 which are mounted to revolve about the axis of the cross-rod. These bearings may also be moved toward or away from the cross-rod, as well as axially of the same. When moved toward the cross-rod, they indent the same and excise some of the metal outwardly, which effect may be increased by a slight axial movement.

In practice, the rod may be pointed and grooved in a single operation, the wheels 106 and 108 all being carried by rotating heads which are arranged to move axially of the cross-rod. The heads are moved apart to permit the blank rod to be placed therebetween, and the heads are then moved axially toward one another in order to point the ends. After the heads have moved inwardly over the ends of the cross-rod, the wheels 108 are moved radially inwardly to form the desired grooves and ridges.

The weight arm 58 with its weight 60 is next secured to the cross-rod, this attachment preferably being effected by spot-welding the wires together.

The manner in which the eyes are assembled on the cross-rod may be explained with reference to Figs. 4 through 8. A suitable fixture or tool is provided having a support 80 for receiving the cross-rod 54 and weight arm 58 and anchoring these against movement. The tool includes slides 82 which are movable toward or away from the support 80. In Fig. 8 they are shown in inward position, but at the beginning of the assembly operation, the slides 82 are to be assumed to be in their outward position beyond the ends of the cross-rod 54, as shown in Fig. 4. Each slide has formed thereon a supporting projection 84 which is shaped to receive the eye member therearound. Generally speaking, the projection 84 is spherically surfaced to receive the eye shell, but the top is cut away or flattened somewhat in order to provide ample clearance for the indented iris portion and the eyelash foundation, etc. The projection 84 is slotted in one direction at 86 to receive the key 56. It is slotted in the other direction at 88 to receive the cross-rod. It is provided with ledges or steps at 90 to receive the notches or recesses 68 of the eye shell. These support and locate the eye shell in proper position relative to the axis of the cross-rod.

In practice, a cross-rod and weight arm assembly is placed on support 80, keys 56 are placed in slots 86, and eyes are placed over the supports 84. The slides 82 are then moved together, thus forcing the ends of the cross-rods through the walls of the eye shells, and further driving the ends of the cross-rod into the keys 56. The keys have previously been stamped to the configuration shown in Figs. 3 and 9, and are provided with a hole for receiving the cross-rod. This hole is preferably slotted at one side and is formed between the lugs 92 shown in Figs. 3 and 9, thereby providing a resilient frictional grip on the cross-rod. The assembled eyeset is then lifted from the tool and is ready for use.

The method of assembly may be described in greater detail with reference to Figs. 4 through

8 of the drawing. The disposition of the keys 56 in the slots 86 is illustrated in the right-hand portion of Fig. 4, this showing the condition of the parts before the eye is placed over the key. The addition of the eye over the key is shown in the left-hand part of Fig. 4. The gripping of the cross-rod and weight arm assembly by the support 80 is shown in the center portion of Fig. 4. At this time the slides 82 are spread apart far enough to receive the cross-rod therebetween.

The slides 82 are then forcibly moved together by appropriate mechanism, not shown in the drawing. The initial penetration of the cross-rod through the inner wall 74 of the eye is clearly shown in Fig. 5. At this time, the hole formed in the eye fits the cross-rod tightly. The final position of the cross-rod is shown in Fig. 6, and it will be noticed that at this time the cross-rod has been pushed through the key 56, and that the enlargement 112 of the cross-rod has passed through the inner wall of the eye, and has enlarged the hole formed in the eye, so that there is an appreciable clearance between the hole and the cross-rod.

This final position of the cross-rod is also shown in Fig. 8, in which the slides 82 have moved toward one another to an inward position which is to be contrasted with the separated or outward position shown in Fig. 4.

It is believed that the construction of my improved eyeset, as well as the method of manufacturing and assembling the parts thereof, will be apparent from the foregoing detailed description thereof. The eye shell is stamped from thin sheet metal which is easily drawn to the desired hemispherical or cup-shape, and which is readily punched by the cross-rod during the subsequent assembly operation.

Despite the simple and inexpensive character of the present eyeset, it nevertheless makes possible the desirable eye adjustments, including a manual rotative adjustment and an automatic axial adjustment of the eyes.

It will be apparent that while I have shown and described my invention in a preferred form, 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. In the manufacture of a doll eye assembly including eye shells reciprocally mounted on a cross-rod, and keys for causing the eye shells to rotate with the cross-rod, while affording self-adjustment of the spacing between the eye shells, the method of providing oversized holes in the eye shells while assembling the eye shells on the cross-rod and keys, which includes causing ridges of metal to be raised to a diameter greater than the normal diameter of the cross-rod, disposing the keys within the eye shells, and thereafter forcing the ends of the cross-rods through the inner side walls of the eye shells and into the keys for such a distance that the ridges are brought well inside the inner walls of the eye shells but are stopped before reaching the keys, while the ends of the cross-rod are stopped well inside the outer walls of the eye shells, said ridges causing the perforations in the inner walls of the eye shells to have a diameter large enough for free movement of the eye shells on the cross-rod, said movement being accommodated without interference between the ridges and the inner walls of the eye shells, and without inter-

ference between the ends and the outer walls of the eye shells.

2. In the manufacture of a doll eye assembly including eye shells reciprocally mounted on a cross-rod, and keys for causing the eye shells to rotate with the cross-rod, while affording self-adjustment of the spacing between the eye shells, the method of providing oversized holes in the eye shells while assembling the eye shells on the cross-rod and keys, which includes preliminarily pointing the ends of the cross-rod, and pressure-scoring the cross-rod within the points by means of peripheral score lines causing metal to be raised near the score lines to a diameter greater than the normal diameter of the cross-rod, disposing the keys within the eye shells, and thereafter forcing the ends of the cross-rod through the inner side walls of the eye shells and into the keys for such a distance that the scorings are brought well inside the inner walls of the eye shells but are stopped before reaching the keys, while the points of the cross-rod are stopped well inside the outer walls of the eye shells, said scorings causing the perforations in the inner walls of the eye shells to have a diameter large enough for free movement of the eye shells on the cross-rod, said movement being accommodated without interference between the scorings and the inner walls of the eye shells, and without interference between the points and the outer walls of the eye shells.

3. In the manufacture of a doll eye assembly, including eyes loosely mounted on a cross-rod, the method of punching oversized holes in previously imperforate side walls of the eyes while at the same time assembling the eyes on the cross-rod, which includes preliminarily raising rings of metal on the cross-rod to a diameter greater than the normal diameter of the cross-rod, and thereafter forcing the ends of the cross-rod and said raised rings through the aforesaid imperforate side walls of the eyes, the ends of said cross rod punching the holes through the side walls of the eyes and said raised rings making the resulting perforations in the eyes large enough for free movement of the eyes on the cross-rod.

4. In the manufacture of a doll eye assembly, including eyes reciprocally mounted on a cross-rod for self-adjustment of the spacing between the eyes, the method of punching oversized holes in previously imperforate side walls of the eyes while at the same time assembling the eyes on the cross-rod, which includes preliminarily pointing the ends of the cross-rod and within the points raising rings of metal to a diameter greater than the normal diameter of the cross-rod, and thereafter forcing the pointed ends of the cross-rod and said raised rings through the aforesaid imperforate side walls of the eyes, the pointed ends of said cross rod punching the holes through the side walls of the eyes and said raised rings making the resulting perforations in the eyes large enough for free movement of the eyes on the cross-rod.

5. In the manufacture of a doll eye assembly, including eyes reciprocally mounted on a cross-rod for self-adjustment of the spacing between the eyes, the method of making oversized holes in side walls of the eyes while at the same time assembling the eyes on the cross-rod, which includes preliminarily pointing the ends of the cross-rod and indenting the cross-rod annularly within the points in order to raise metal annularly at the indentations to a diameter greater than the normal diameter of the cross-rod, and

thereafter forcing the pointed ends of the cross-rod and said raised rings through side walls of the eyes, said annularly raised metal rings making the perforations in the eyes large enough for free movement of the eyes on the cross-rod.

6. In the manufacture of a doll eye assembly, including eyes reciprocally mounted on a cross-rod and keys for causing the eyes to rotate with the cross-rod while affording self-adjustment of the spacing between the eyes, the method of providing oversized holes in the eyes while at the same time assembling the eyes on the cross-rod and keys, which includes preliminarily pointing

the ends of the cross-rod and pressure-scoring the cross-rod within the points in order to raise metal at the score lines to a diameter greater than the normal diameter of the cross-rod, then
5 disposing the keys within the eyes, and thereafter forcing the ends of the cross-rod through side walls of the eyes and into the keys, said raised metal being forced through said side walls and making the resulting perforations in the eyes
10 large enough for free movement of the eyes on the cross-rod.

SAMUEL MARCUS.