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F. SCHLEICH

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APPARATUS FOR PRODUCING TOY PUPPET OR ANIMAL FIGURES

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2 Sheets-Sheet 1

Fig. 1

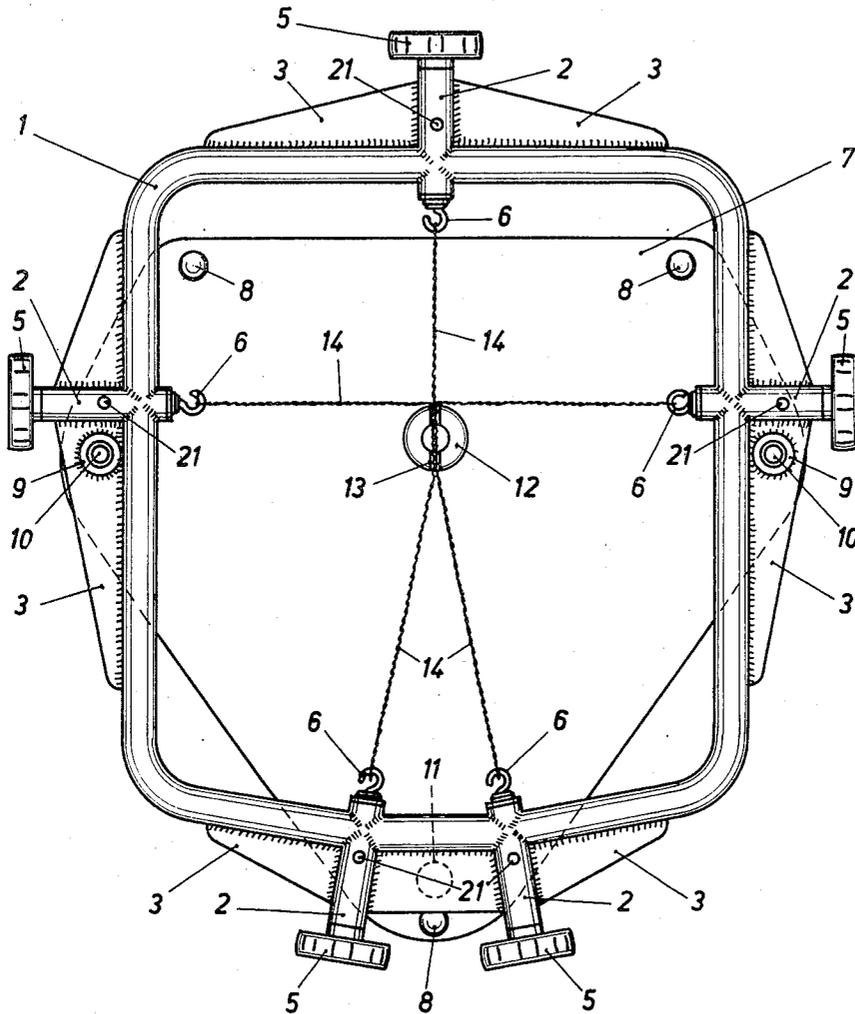
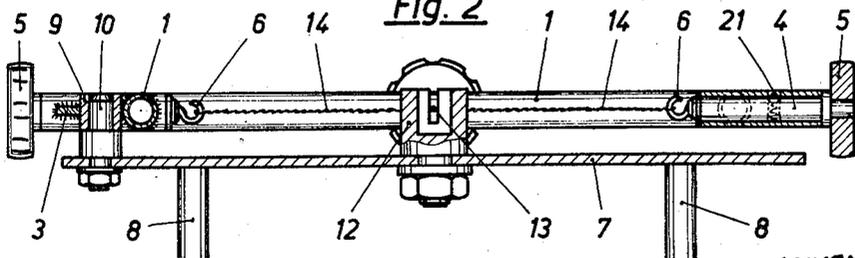


Fig. 2



INVENTOR

FRIEDRICH SCHLEICH

by *Wilkinson Maunier*
Attys.

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APPARATUS FOR PRODUCING TOY PUPPET OR ANIMAL FIGURES

Friedrich Schleich, Schwabisch Gmund, Germany

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3 Claims. (Cl. 18—36)

This invention relates to apparatus for manufacturing puppet or animal toy figures of the kind in which a skeleton of flexible wire is provided with a covering of a rubber-like plastic mass.

In accordance with this invention the skeleton is placed under tension and positioned exactly in the centre, of a two-part mould, into which a rubber-like plastic mass is poured or pressed, and after solidification of the mass, the projecting wire ends of the skeleton are cut off and the figure freed from the mould parts. Due to the fact that the wires of the skeleton are under tensile stress in the mould, they are always held in the correct position and are unable to alter their position even while the plastic mass is being pressed or poured into the mould. This is of great importance for the production of a satisfactory and uniform product, and is particularly important in the case of figures which have thin limbs and body members. The tensile stress of the wires also makes it possible to use particularly soft wires, for example wires which are twisted from a plurality of very fine wires. Such soft wires which otherwise would be very difficult to hold in position in the mould, are particularly suitable for the wire skeletons of flexible figures, with the manufacture of which the invention is concerned.

The tensile stressing of the wires may be produced by any convenient means. Preferably, the skeleton is formed by two or more strands of wire which are twisted together to produce the tensile stress.

The apparatus for carrying out the method includes a frame, in the sides of which the means for tensioning the wires are provided. The wire skeleton is positioned on the frame to extend between the side and end members of the frame the wires are tensioned and the mould parts are then placed on it. If the tensile stress is to be produced by twisting the wires laid two-fold or multi-fold, the means for tensioning the wires are provided in the sides of the frame in the form of rotatable spindles, having hooks for the engagement of the two-fold or multi-fold laid wires.

The frame may be detachably supported on a plate by means of a push-in pin connection the plate being provided with guide means for positioning the wires. For holding the wires accurately in the mould, guide grooves are also provided in the lower half of the mould these grooves serving to locate the parts of the wire skeleton which enter into the mould. Said grooves may be provided in separate insertion pieces.

To enable the invention to be more fully understood it will now be described with reference to the accompanying drawings in which:

Fig. 1 is a plan of the apparatus adapted to tension the wire skeleton,

Fig. 2 is a cross-section of Fig. 1,

Fig. 3 is a plan of the tensioning frame with the lower mould half brought into the working position, and

Fig. 4 is a cross-section of Fig. 3 but with the two parts of the mould in position.

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As shown in the accompanying drawings the apparatus comprises a frame 1, for example of rectangular shape, in which the wire skeleton is positioned. Provided on the sides of the frame, at the points at which the wires of the skeleton are to end, are bearing members 2, which extend substantially co-axially to the direction of the wire to be applied. The arrangement of the bearing members 2 thus depends upon the shape of the figure which is to be made. The bearing members project outwardly and are stiffened by ribs 3. Rotatably mounted in the bores of the bearing members 2 are spindles 4, which carry rotatable knobs 5. The ends of the spindles projecting into the inside of the frame are provided with hooks 6 for engagement of the wires.

Associated with the frame 1 is a holding plate 7, standing firmly, for example by means of feet 8, on a table in the inclined position, after the manner of a sloping top desk. The frame 1 is supported on the plate by means of push-in pin connections formed by holes 9 in the frame and pins 10 of the holding plate 7. By means of this connection of the frame 1 with the stationary holding plate, convenient working conditions are provided for the positioning and tensioning of the wires.

Guide means for positioning of the wires may be provided on the plate 7 and in the example shown in the accompanying drawings such a guide means comprise a pin 12 bolted to the holding plate 7 and provided with a slot 13.

The conventional human figure selected as an example, requires five connecting points for the skeleton wires 14, namely two for the wires of the legs, two for the wires of the arms and one for the wire passing through the neck and head. The guide piece 12 in this case assists the positioning of the body part of the skeleton which is produced inside the slot 13 by twisting the two wires forming the legs. Preferably, the skeleton is formed by two or more strands of wire so that loops are formed at the ends of the limbs etc. for engagement by the hooks 6 of the spindles 4. At the point of intersection, the adjacent wire ends are bound together by means of a pair of pliers. The spindles 4 are now rotated by means of the knobs 5. The wire pieces laid two-fold, and forming the individual limbs, are given a twist which, at the same time, results in a shortening of the limbs, so that finally a tensile stress is produced. To prevent the spindles 4 from automatically turning backward, catch means is provided, which as shown comprises, a ball held under spring force and inserted in a transverse bore in the spindles 4 and adapted to engage in a hole 21 of the bearing member 2.

After the wires of all the lines of the wire skeleton 14 have been sufficiently tensioned, the frame with the tensioned wire skeleton is lifted off the holding plate 7, and a lower mould member 15 is placed in position as shown in Figs. 3 and 4. For ensuring the exact positioning of the wires relatively to the mould cavity 18, guide pieces 19 and 20 having grooves for the wires are provided on the lower mould half. When the skeleton 14, held under tension in the frame 1 has been correctly placed in the lower mould 15, the upper mould 16 is placed on the latter. The correct position of the two mould halves, relatively to each other, is ensured by register pins 17.

The cavity 18 of the mould can now be filled with the mass adapted to form the outer shape of the figure. The mass may be poured into the mould or may be forced therein under high pressure. Preferably masses are employed which, after solidification, have a rubber-like behaviour. Plastic synthetic masses or natural rubber masses may be used. Pressing in of the mass should be carried out in the cold state or with the application of heat according to the choice of material.

After solidification of the mass, the mould halves 15 and 16 are removed. The figure then hangs in the frame 1 by

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the wires of the skeleton 14 which are still under tensile stress. The wire pieces projecting from the figure are cut off. This can be done individually at the five points of the constructional example by hand by means of a pair of pincers. It is possible, however, to provide a special cutting device by means of which all the wires are severed at the same time.

I claim:

1. Apparatus for manufacturing flexible puppet or animal toy figures having a wire skeleton covered by a mass of flexible material, comprising a frame having side and end walls, means on said frame for securing the said wire skeleton, additional means on said frame for twisting and tensioning said skeleton, a two part mould positioned within the area defined by said side and end walls and spaced inwardly of and out of contact with said side and end walls, and means on said mould for locating it in correct position.

2. Apparatus according to claim 1 wherein said additional means includes spindles rotatably mounted on said frame, said spindles carrying said means for securing the wire skeleton to said frame, and detent means for locking said spindles against rotation.

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3. Apparatus for manufacturing flexible puppet or animal toy figures having a wire skeleton covered by a mass of flexible material comprising a frame for supporting said wire skeleton, a supporting plate for said frame, means for detachably securing said frame to said supporting plate while the skeleton is assembled on said frame, means carried by said supporting plate for guiding wire adapted to form part of said skeleton when the latter is assembled on said frame, a two part mould, and means on said mould for locating it in position around said skeleton.

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