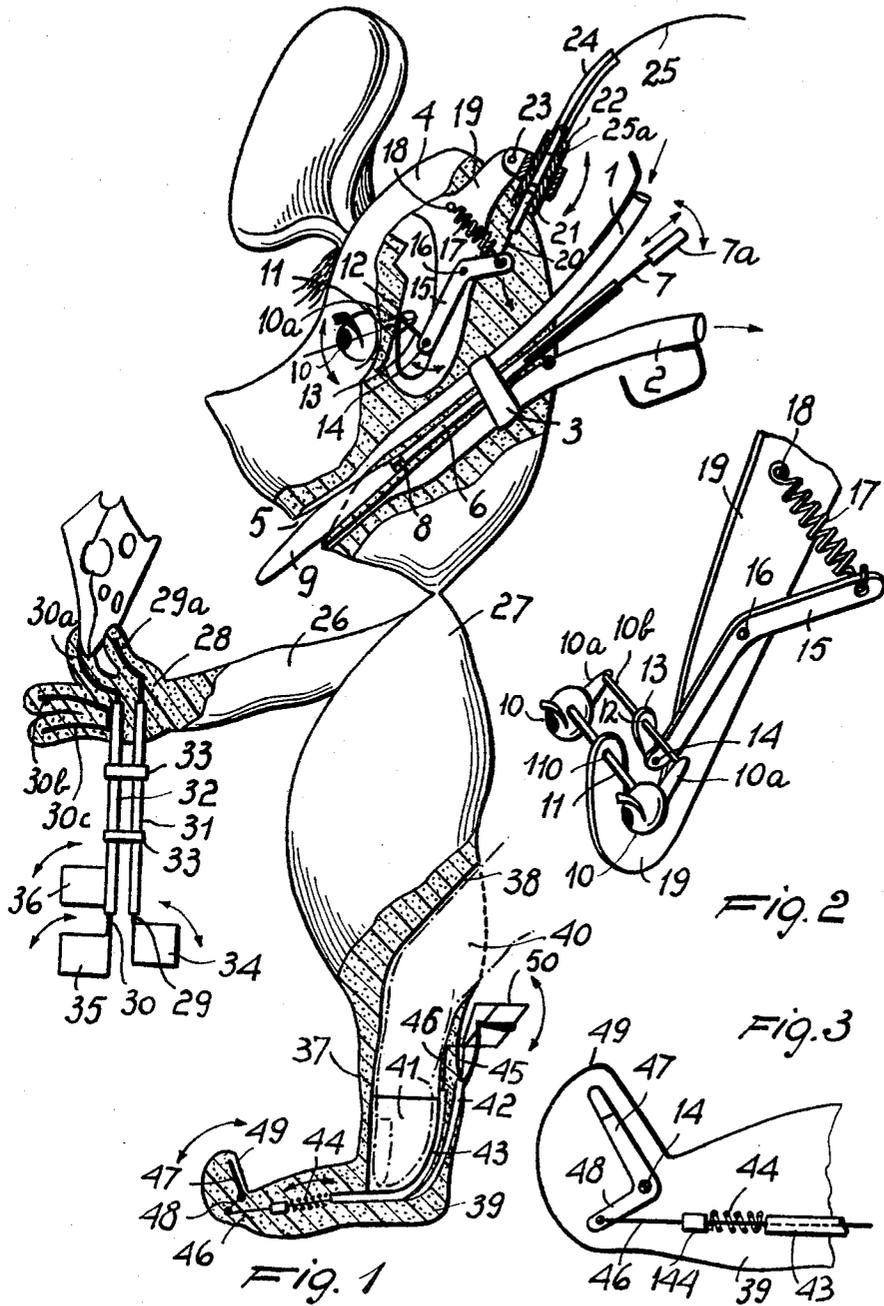


Oct. 19, 1965

**MARIA CALDURA NEE PEREGO 3,212,213**  
GESTICULATING PUPPET HAVING A HUMAN LIKE CONFIGURATION,  
PARTICULARLY ADAPTED FOR DIRECT TELEVISION TRANSMISSION,  
AND/OR KINESCOPIC TELEVISION TRANSMISSION  
OF SCENOGRAPHIC PERFORMANCES  
Filed Oct. 14, 1963



INVENTOR  
MARIA CALDURA nee PEREGO

BY

*Karl J. Ross*  
AGENT

1

2

3,212,213  
**GESTICULATING PUPPET HAVING A HUMAN LIKE CONFIGURATION, PARTICULARLY ADAPTED FOR DIRECT TELEVISION TRANSMISSION AND/OR KINESCOPIC TELEVISION TRANSMISSION OF SCENOGRAPHIC PERFORMANCES**

Maria Caldurà née Perego, Via Parcello Pucci 6, Milan, Italy

Filed Oct. 14, 1963, Ser. No. 315,948  
 6 Claims. (Cl. 46-135)

This invention relates to television scenographic performance techniques in direct television transmission and/or kinescopic television transmission when using marionette-puppets, animated by operators not visible to the spectators.

Scenographic performances by means of marionette-puppets, animated by operators not visible to spectators, are known. According to these known techniques, the puppets assume various operating configurations depending upon whether the animation by the operator occurs directly by manipulation of the puppet or indirectly through flexible-wire actuation means. In the first case, there are the so-called "Punch and Judy show puppets" which, to be animated by direct manipulation, have an incomplete shape and are restricted to the figurative representation only of the upper part of the character which is connected to a flexible sleeve which receives the operator's arm for the animation of the puppet. In this case, the effectiveness of the scenographic performance is considerably limited due to the incompleteness of the character and its structural nature which, for the figurative part, is normally limited to rigid stylized configuration forms.

In the second case the puppets are so-called "marionettes" which are animated through flexible-wire actuation means and can have a more complete shape than the Punch and Judy puppets but, because of the animation system, the scenographical repertoire is very limited and hardly true-to-life. In both cases the puppet's animation often requires the action of a number of operators, so that because of their simultaneous presence a further limitation arises in the repertoire to the extent of causing the marionette to appear motionless with respect to the scenery.

The operators who are not visible to the spectators usually are camouflaged in black, against a black backdrop so that the puppet itself is presented to the observer on a black background to the effect that background and operators may blend.

Earlier performances were given to audiences with the direct attendance of public spectators, without giving rise to a simultaneous or subsequent re-transmission of the performance. With the modern techniques of simultaneous telecast and subsequent kinescopic re-transmissions, performances of this type with conventional puppets have been found to be unsuitable with regard to both the limitation of repertoire and the need for the operators to disappear against the dark background; this requires under-exposure from the viewpoint of the luminous intensity of the images to be shot, which results in technically imperfect and illegible images at times.

It is the main object of this invention to provide the possibility of carrying out direct and/or kinescopic telecast of scenographical performances by means of a puppet simulating a living creature having a generally human configuration, which can be directly animated with a wide range of movement affording a large scenographical repertoire.

It is another object of this invention to provide a puppet simulating a living creature having a human con-

figuration, which can be animated with gestures, actions and movements of parts or organs of the puppet themselves with a high degree of effective mimicry.

It is still another object of this invention, conforming with the idea of one or more of the preceding objects, to provide a puppet according to the invention, not required to operate on the basis of outside lighting effects but instead capable of creating an image or figure with a self-illumination whereby the image appears satisfactorily lighted, while the operator or operators are so scarcely lighted as to be practically invisible when camouflaged in black against a black background.

It is still a further object of the invention to make it possible to obtain a more accentuated flexibility of the body or mass of the animatable puppet as well as a higher elasticity thereof so as to afford a wider range of mobility of said puppet to the entire advantage of the performance.

A further but not last object of the invention consists in creating by this puppet the figure of a living creature having a human configuration, adapted to pursue the preceding objects by using a particularly effective practical structure of easy handling and of low cost.

These and other objects are attained by the puppet simulating a figure of a living creature according to this invention having a human configuration, particularly adapted for scenographical performances in direct television and/or kinescopic telecast transmission, which is characterized by a body or mass of material having high characteristics of flexibility, development softness and having a size which is preferably of the order or slightly greater than a man's hand for allowing said puppet to be animated according to a widespread repertoire of gestures, actions and movements of high mimic effect, derived from the individual action of the fingers of one operator's hand and combined action of both the hands of the operator, acting advantageously with two fingers of one hand driven through the rear part of the puppet and directed from above downwardly into the interior of the lower limbs and holding with the other hand the rear control means for the upper part of the puppet, said control means being structurally so arranged as to be manoeuvrable by the combined action of parts or members connected to the upper part of the puppet. The material of high flexibility characteristics from which the body or mass of the animatable puppet is made is advantageously provided from the type derived from the solidification of foam of synthetic resins having a cellular (sponge-like) structure of which also a further characteristic, which has been heretofore unobserved in sponge-like synthetic materials, is deliberately jointly exploited for optical purposes. It is, in fact, well known that these sponge-like synthetic materials are obtained by solidification of suitably prepared emulsions. As a consequence of such a kind of processing, said synthetic materials of the sponge-like type are constituted of a structure in which each cell or alveolus forms at least a small face or facet, so that there is collectively a plurality of facets, which behave, when lighted, as a reflector body. In such way, the necessary conditions are thus obtained to the effect that with the same illumination the puppet produces a lively image during the shooting which image is in contrast with practically non-existent image, of the operators, camouflaged against the respective background. In the further development of this invention, another characteristic of the sponge-like plastic materials, of which no profit has been taken up to now in the art, is optically deliberately exploited in the specific technical field of the scenographical performances by directly animatable puppet; it is, in fact, well known that such sponge-like plastic materials, by virtue of their cellular structure, absorb the light rays and diffuse them throughout their mass to the extent that, for example, the

body of a relatively substantial thickness, only one side of which is directly illuminated will practically be lighted with diffused light also on the opposite side.

With particular but non-limiting reference to the kinematic and/or telecast shooting, such a characteristic is now translated into a substantial elimination of shadow zones and into extremely advantageous lighting possibilities, in relation to objects such as puppets and figurative bodies having a considerable physical consistency, as compared with what could ever be obtained by means of the usual materials, in which an internal optical diffusion was only possible in relation to objects having substantially two dimensions, i.e., a negligible thickness.

Further characteristics and advantages will become more apparent from the following detailed description of a preferred but nonlimiting embodiment of the animatable puppet according to this invention, illustrated by way of example in the accompanying drawing, in which:

FIG. 1 is an elevational side view with some parts removed and some others in section in order to better show the various member with their operating and functional structure; and

FIGS. 2 and 3 show details of the controlling mechanisms in enlarged scale.

The embodiment represented in the drawing is described hereunder merely by way of example as a puppet simulating a small living creature having a human configuration. Such small creature is made in its general physical structure of a material having high flexibility and softness characteristics like that obtained by solidification of emulsions of suitably prepared synthetic resins giving rise to a structure of the solidified material having a cellular (sponge-like) configuration.

The humanlike-animal-simulating puppet according to the invention comprises a head 4, a trunk 27, arms 26 and legs 37 substantially made of the above mentioned expanded plastic, elastic, cellular material with reflecting internal facets. Each part of the puppet is elastically deformable, thanks to the material used, by means of head-controlling means, leg-controlling means and hand-controlling means.

The head-controlling means are constituted of a handle which is structurally formed of two spaced members 1 and 2 having a substantially tubular rod-like configuration. The members 1 and 2 are connected and maintained spaced from one another by means of a clip or elastic clamp member 3 which, due to its own elasticity, allows relative rotation of the members 1 and 2 thereabout and serves consequently as a fulcrum therefor. The tubular rod-like members 1, 2 are embedded within the cellular or expanded plastic material forming the body of the puppet. The members 1 and 2 extend through the head 4 of the puppet and project with their ends from the rear part of the head in such a manner that by acting upon said handle members 1 and 2 and because of the elastic action of the engagement clamp member 3 there occurs the opening and respectively the closing of the mouth 5 of the puppet under said elastic action.

Parallel to the members 1 and 2 and contiguous thereto, there is provided therebetween a tubular member 6 into which is driven a rod-shaped member 7 extending through said tubular member 6 up to the cavity of the mouth 5 at which same is connected with a member 9 simulating the tongue of the puppet by means of an elastically flexible rigid cable element 8. Said member 7 is guided within the aforesaid tubular member 6 in such a way as to be able alternately to slide lengthwise and swing around its own axis, when actuated on its free end 7a. In this way, besides the opening of the mouth 5 through the actuation of the handle members 1 and 2, the gradual putting out and/or respectively the swinging of the tongue 9 may be carried out by acting accordingly on said sliding and swinging rod member 7. The tubular members 1 and 2 provide communication means putting the cavity of the mouth 5 into communication with the

outside at the neck of the puppet in order to provide operating animation possibilities of the puppet resembling emissions and deglutitions of products by the puppet itself. The members 10 of the puppet are eyes of the puppet oscillatably encased into corresponding recesses provided in the expanded plastic material of the puppet's head and simulating eye orbits.

The eyes 10 are made in the form of a ball whereon eyelashes are secured and the iris and cornea are depicted. The part of the eyeball beyond the eyelashes simulates the eyelids. The eyeball 10 may oscillate around the axis 11 in such a way as to take variable positions, including those of opening and respectively closing the eyes. The eyeballs 10 are provided inside the head 4 with projections 10a connected at their ends by a cross rod 10b on which there is articulated in 12 the end of a small rod 13 (FIG. 2) the other end of which is articulated in 14 at one end of a lever 15 pivoted in 16 and at the other end of which the end of a return spring 17 is connected which spring is fixed with its other end to a fixed point 18 of a plate 19 embedded into the head 4 and providing the support means for the fulcrum 16 and the fulcrum 110 of the axis 11 connecting the eyeballs and capable of rotating in the fulcrum 110. At the same end of the lever 15 there is connected the end of the stem 20 of a plunger 21 sliding in a sleeve 22 carried fixed in 23 on said plate 19.

To this sleeve 22 there is connected the end of a member 24 in the form of a rather stiff tube or hose into which a flexible cable member 25 of the well known Bowden cable type is inserted. The end 25a of the Bowden cable is connected with the aforesaid plunger 21 and controls the latter when the opposite outer end of the Bowden cable is actuated. The arms 26 of the puppet, due to the nature of material from which the structural mass of the puppet is made, are movable with respect to the body 27. The gesticulation of the hands 28 is controlled by hand-controlling means comprising for each hand two rod elements 29 and 30 having their upper ends bent as at 29a and 30a, respectively. The bent ends 29a, 30a are embedded in two fingers of the hand while the rods 29 and 30 are slidably inserted in tubular sheath 31, 32 embedded with the upper ends thereof in the palm of the respective hand. Fixed on the embedded end of the tubular member 32 are elastic rod elements 30b and 30c embedded in the ring and little fingers respectively. The tubular members 31 and 32 are elastically engaged with one another by elastic connection means 33. The bent end 29a of the member 29 is embedded into the thumb of the hand, whilst the bent end 30a, is embedded in the forefinger of the hand. At the free ends of members 29, 30 and 32 are provided control knobs in the form of vanes 34, 35, 36, suitable to insure the independent actuation of members 29, 30, 32 for the individual or combined animation of the hand and/or fingers. The legs 37 have each a cavity 38 extending into the corresponding leg from the foot 39 to its upper part where such cavity 38 outwardly opens at the rear of the puppet to allow the introduction of an operator's finger 40 in each leg for the actuation of the puppet by the operator as will be seen hereinafter. The legs controlling means are provided in part on the bottom of the cavity 38 where a thimble member or a tip member 41 made of rigid material and underneath said member 41 there are provided, embedded into the foot 39, two tubular members 42 and 43 extending from the forward end of said foot 39 up to the rear part of the leg above said thimble member 41. Said tubular members 42 and 43 have a section 44 which is elastically articulated near the central part of the sole of the foot 39 to allow also the foot to be bent if desired. Into each tubular member 42, 43 a Bowden-type cable member 45 and 46, respectively, is inserted which is connected at one end with an articulated lever system consisting of the articulated levers 47 and 48, said levers being embedded into the big toe 49 and in the remaining toes of the foot (not

shown). As shown in FIG. 3, lever 47, 48 is of the elbow type and is pivotably pivoted on a pivot 147 which extends transversely to the toes and on which is pivoted also another identical elbowed (not shown) lever juxtaposed to the lever 47, 48 and controlled by the Bowden cable 42, while lever 47, 48 is controlled by the Bowden cable 43. The return spring of the Bowden cable is constituted of spring member 44 abutting with one end thereof against the contiguous end of the stiff sheath 43 (FIG. 3) and abutting with the other end thereof against a block 144 rigidly connected with the cable 46. Cable 45 and 46 are actuated through knobs 50 in the usual manner.

From the above description it clearly appears how the puppet can be actuated by one single puppeteer according to a widespread repertoire of gestures, actions and movement of high mimic and spectacular effect which is instilled in each animatable part and particularly in those parts of the body which are mostly subjected to contraction movements by putting from the rear side two fingers 40 of the operator's hand into the cavity 38 of legs 37 of the puppet and holding with the other hand the control members 1 and 2 as an operating elastic handle for the movements of the mouth and tongue, it being also possible for the operator to simultaneously actuate with the free fingers of his hands the cable member 25 for the actuation of the eyes and the control member 50 for the movements of the toes. With his mouth on the tubular members 1 and 2 the operator may provide operating animation possibilities resembling the emissions and deglutitions of various products by the puppet. Also the actuation of the arms 26 is controlled by the operator in view of the flexible nature of the constitutive material of the puppet and in consideration of the general non-contracted position of such limbs, whilst particular movements of said arms and hands may be governed from time to time by a second operator, depending upon the performance requirements, by operating the control means 34, 35, 36 as formerly described.

In this way, it becomes apparent that one not only obtains the movements offered by each operating hand but also those movements deriving from the combination of the combined displacements of both hands between one another as for example in connection with characteristics, walks, inclinations of the puppet body in each direction and the like. Consequently, one obtains a kind of animation with marked advantages over the specified techniques known heretofore, i.e.; maximum improvisation possibilities due to the fact that the puppet is governed by one single main operator; reduction of the number of the operators with the consequent minimum space required by the bodies of the same operators, which heretofore has compelled the marionette-puppet to a sort of motionlessness with respect to the scenography; as a further consequence, there are larger movement possibilities of the puppet with respect to the scenographical performance field and wider possibilities of quick displacements permitting the puppet to participate in any theatrical event sequence thanks to a wide repertoire of gestures, actions and movements of high mimic and spectacular effect. Furthermore, with particular reference to the nature of the cellular (sponge-like) synthetic material, there is to be noted the particular advantages afforded by the puppet according to this invention when the performance is carried into effect in relation to simultaneous shooting facilities or subsequent retransmission facilities, in which the optical phenomena of which the invention deliberately takes profit so neatly affect the image quality given the puppet so as to ensure an observation of such qualities even by naked eye, so that the puppets find advantageous applications even in direct theater performances.

It will be appreciated that the elastic porous highly flexible sponge-like light reflecting synthetic material of which the puppet is made allows high elastical deformations through which the volume or at least a dimension thereof may be increased or diminished several times with respect

to the size of such volume or dimension in the normal condition.

The elastic synthetic material of which the body of the puppet is made is preferably obtained from the expanded polyurethane resins known under the commercial name "Moltopren" as produced by the firm of Bayer, of Leverkusen, Germany.

I claim:

1. A three-dimensional puppet for high-lighted performances against a dark background, comprising an anthropomorphic integrally formed substantially solid body of an internally reflecting cellular resilient synthetic-resin material illuminable over limited areas of said body to provide an impression of internal lighting of over substantially the whole surface thereof, said body having a torso, a head member flexibly mounted on said torso, a pair of arm members flexibly extending from an upper portion of said torso and a pair of leg members flexibly depending from a lower portion of said torso, said leg members being formed with upwardly and rearwardly open passages for receiving respective fingers of an operator and individual movement thereby, said leg members each being provided with respective movable foot portions, said head member being formed with an opening in said resilient material defining a mouth; first mechanism in said leg members and controllable externally thereof in the region of said passages for moving said foot portions relatively to the remainder of the respective leg members; and second mechanism received in said head member and extending rearwardly therefrom, but terminating in the immediate vicinity of said head member for distending said material in the region of said mouth opening selectively to form mouth movements.

2. A three-dimensional puppet for high-lighted performances against a dark background, comprising an anthropomorphic integrally formed substantially solid body of an internally reflected resilient foamed polyurethane material illuminable over limited areas of said body to provide an impression of internal lighting over substantially the whole surface thereof, said body having a torso, a head member flexibly mounted on said torso, a pair of arm members flexibly extending from an upper portion of said torso and a pair of leg members flexibly depending from a lower portion of said torso, said leg members being formed with upwardly and rearwardly open passages for receiving respective fingers of an operator and individual movement thereby, said leg members each being provided with respective movable foot portions having flexible toes, and head member being formed with an opening in said resilient material defining a mouth; first mechanism imbedded in said leg members and controllable externally thereof in the region of said passages of moving said toes of said foot portions relatively to the remainder thereof, said first mechanism including a lever imbedded in each of said foot portions and extending into the toes thereof, respective flexible-cable means connected at the end of each of said levers, and handle means externally of said leg members for operating said flexible-cable means; and second mechanism received in said head member and extending rearwardly therefrom, but terminating in the immediate vicinity of said head member for distending said material in the region of said mouth opening selectively to form mouth movements.

3. A three-dimensional puppet for high-lighted performances against a dark background, comprising an anthropomorphic integrally formed substantially solid body of an internally reflecting cellular resilient synthetic resin material illuminable over limited areas of said body to provide an impression of internal lighting over substantially the whole surface thereof, said body having a torso, a head member flexibly mounted on said torso, a pair of arm members flexibly extending from an upper portion of said torso and a pair of leg members flexibly depending from a lower portion of said torso, said leg

7

members being formed with upwardly and rearwardly open passages for receiving respective fingers of an operator and individual movement thereby, said leg members each being provided with respective movable foot portions, said head member being formed with an opening in said resilient material defining the mouth; first mechanism in said leg members and controllable externally thereof in the region of said passages for moving said foot portions relatively to the remainder of the respective leg members; second mechanism received in said head member and extending rearwardly therefrom, but terminating in the immediate vicinity of said head member for distending said material in the region of said mouth opening selectively to form mouth movements, said head member being further provided with a pair of recesses forming eye sockets; a pair of generally spheroidal eye members movably received in said sockets and having a common axle interconnecting said eye members for joint rotation about the axis of said sockets; and third mechanism imbedded in said head member and operable externally thereof for rotating said axle, said third mechanism including a support rotatably receiving said axle, a link fulcrumed on said support and coupled with said eye members for displacing same on said axle, and flexible-cable means cooperating with said link and extending from said head member for operating said eye members.

4. A three-dimensional puppet for high-lighted performances against a dark background, comprising an anthropomorphic integrally formed substantially solid body of an internally reflecting resilient foamed polyurethane material illuminable over limited areas of said body to provide an impression of internal lighting over substantially the whole surface thereof, said body having a torso, a head member flexibly mounted on said torso, a pair of arm members flexibly extending from an upper portion of said torso and a pair of leg members flexibly depending from a lower portion of said torso, said leg members being formed with upwardly and rearwardly open passages for receiving respective fingers of an operator and individual movement thereby, said leg members each being provided with respective movable foot portions having flexible toes, said head member being formed with an opening in said resilient material defining a mouth, said arm members being provided with flexible finger members first mechanism imbedded in said leg members and controllable externally thereof in the region of said passages for moving said toes of said foot portions relatively to the remainder thereof, said first mechanism including a lever imbedded in each of said foot portions and extending into the toes thereof, respective flexible-cable means connected at the end to each of said levers, and handle means externally of said leg members for opening said flexible-cable means; second mechanism received in said head member and extending rearwardly therefrom, but terminating in the immediate vicinity of said head member for distending said material in the region of said mouth opening selectively to form mouth movements, said head member being further provided with a pair of recesses forming eye sockets, a pair of generally spheroidal eye members movably received in said sockets and having a common axle interconnecting said eye members for joint rotation about the axis of said sockets; and third mechanism imbedded in said head member and operable externally thereof for rotating said axle, said third mechanism including a support rotatably receiving said axle, a link fulcrumed on said support and coupled with said eye members for displacing same on said axle, and further flexible-cable means cooperating

8

with said link and extending from said head member for operating said eye members; and fourth mechanism imbedded in said arm member for selectively displacing at least some of said finger members.

5. A manually operable puppet comprising an anthropomorphic body integrally formed from a cellular synthetic resin and having a torso and a head member, a pair of arm members and a pair of leg members flexibly affixed to said torso; and actuating means for said members imbedded in said body while extending outwardly thereof for manipulating said head and leg members, said leg members being provided with upwardly open passages terminating at the rear of said body for receiving the fingers of a manipulator, said actuating means for said leg members including foot-control means imbedded in said body for displacing the extremities of said leg members, said foot-control means having manually movable means adjacent the openings of said passages for operation by the hand of the manipulator, the fingers of which are received in said channels, said head member being formed with an opening defining a mouth, and actuating means including a mechanism for spreading and synthetic resin in the region of said mouth for varying the configuration thereof, said mechanism comprising two juxtaposed rod members spaced from each other and embedded in said body while having diverging handle portions projecting outwardly of the rear of said body and an elastic connecting member elastically connecting said rod members at an intermediate portion thereof the ends of said rod members opposite to said handle portions terminating above and below said mouth, an extendable tongue member at the region of said mouth between said rod members, a sheath member in alignment with said tongue member rearwardly arranged thereto with said body and a stem member slidable and rotatable within said sheath member and connected with one end thereof to said tongue member and with the other end thereof projecting from said sheath member outwardly of the rear of said body, said stem member having a handle portion for longitudinally shifting and rotating said tongue member, and movable eye means in said head member, said actuating means including a further mechanism for displacing said eye means and a flexible cable operable externally of said body for activating said further mechanism.

6. A puppet as defined in claim 5 wherein said rod members are tubular enabling the discharging and imbibing of material through said mouth.

#### References Cited by the Examiner

##### UNITED STATES PATENTS

3,070,920	1/63	Bunin	46—156 X
3,099,894	8/63	Carroll	46—123 X

##### FOREIGN PATENTS

914,973	7/46	France.
1,126,494	7/56	France.
371,130	3/23	Germany.
594,022	3/34	Germany.
835,088	5/60	Great Britain.

##### OTHER REFERENCES

De Bell, J. M. et al.: German Plastics Practice, Springfield, Mass., De Bell & Richardson, 1946. TP 986A 2D 32, pages 463-465 relied on.  
Germany, 7727X1, Nov. 29, 1956.

RICHARD C. PINKHAM, *Primary Examiner*.