



US 20060094330A1

(19) **United States**

(12) **Patent Application Publication**

**Privett**

(10) **Pub. No.: US 2006/0094330 A1**

(43) **Pub. Date: May 4, 2006**

(54) **SYSTEM AND METHOD FOR THREE-DIMENSIONAL ANIMATION OF ROD-ARM PUPPET EXTREMITIES**

(52) **U.S. Cl. .... 446/330**

(75) **Inventor: David M. Privett, Parker, CO (US)**

(57) **ABSTRACT**

Correspondence Address:

**LEE G. MEYER, ESQ.  
MEYER & ASSOCIATES, LLC  
17462 E. POWERS DRIVE  
CENTENNIAL, CO 80015-3046 (US)**

A system and method for three-dimensional animation of rod-arm puppet extremities employing a snap fastener having the stud element attached interior the hand on a rigid support element; and, a closure element carried on a flexible support structure which is capable of an arcing, rotational movement about the control rod. Thus, rotational movement is provided between the control rod and the hand (foot) in two planes giving the puppet extremity the appearance of smooth continuous movement without jerkiness or "floppy hands" (feet) or the familiar unnatural movement. The rod can be disconnected from the extremity for transportation and/or storage, yet provides secure rotational engagement of the rod and the extremity during performance. In another embodiment the rigid support element carries a plurality of outstanding, deformable members which give rigidity to the fingers on the hand.

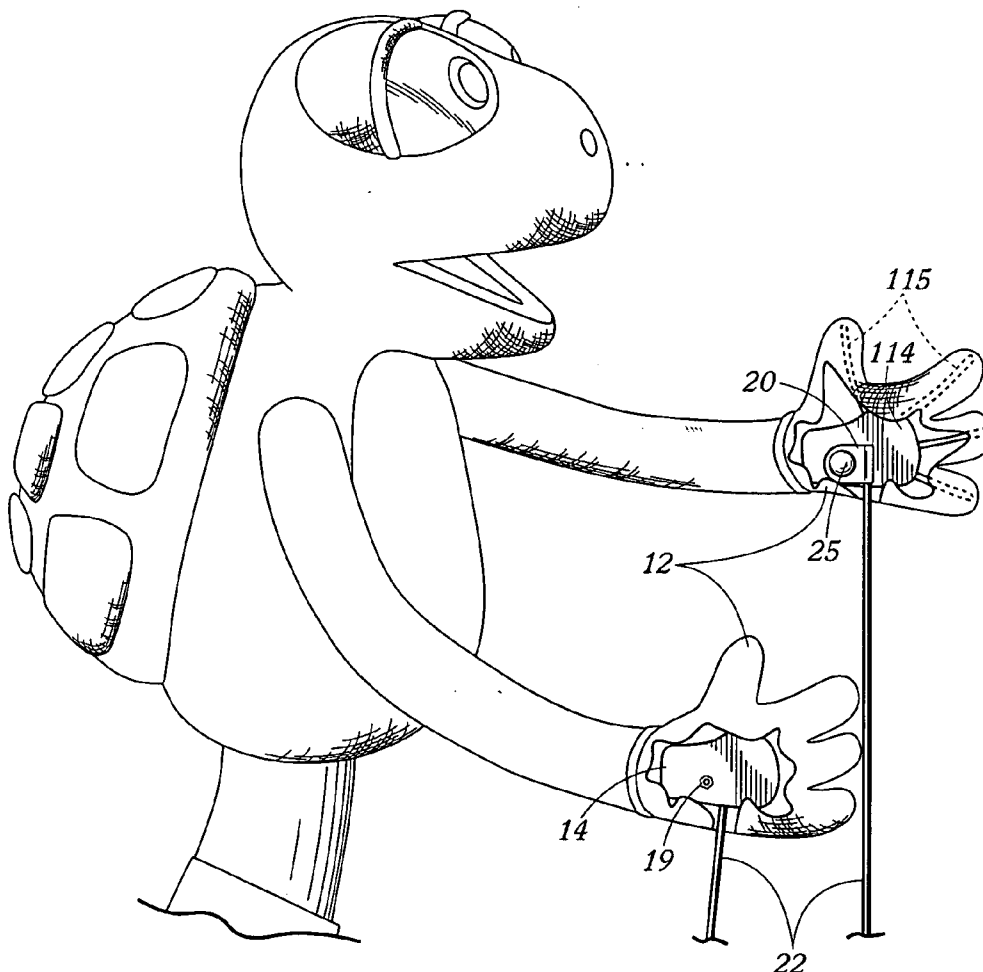
(73) **Assignee: PLAYSOU, LLC**

(21) **Appl. No.: 10/979,991**

(22) **Filed: Nov. 3, 2004**

**Publication Classification**

(51) **Int. Cl. A63H 3/20 (2006.01)**



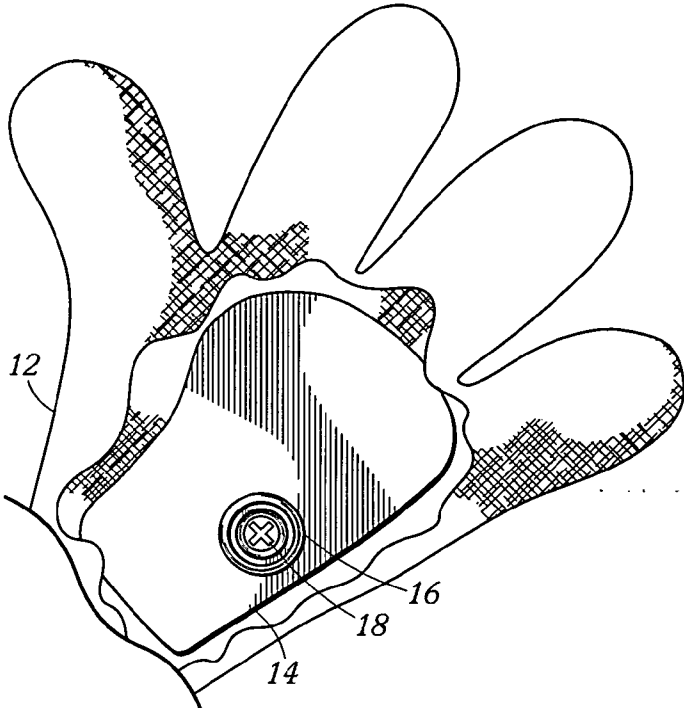


FIG. 1

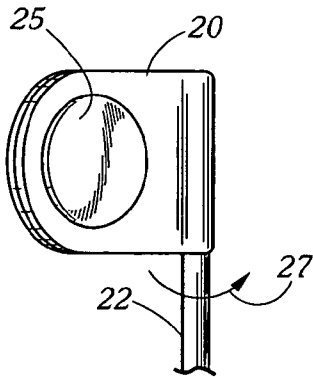


FIG. 2

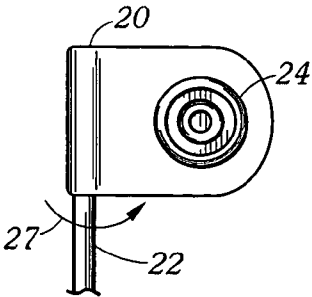


FIG. 3

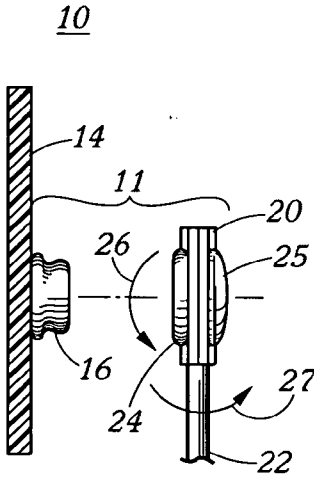


FIG. 4

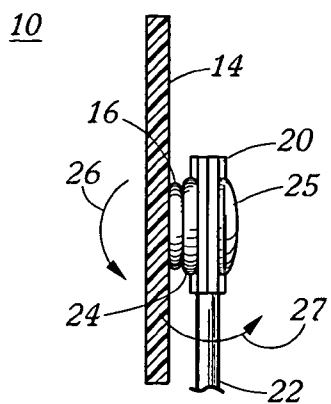


FIG. 5

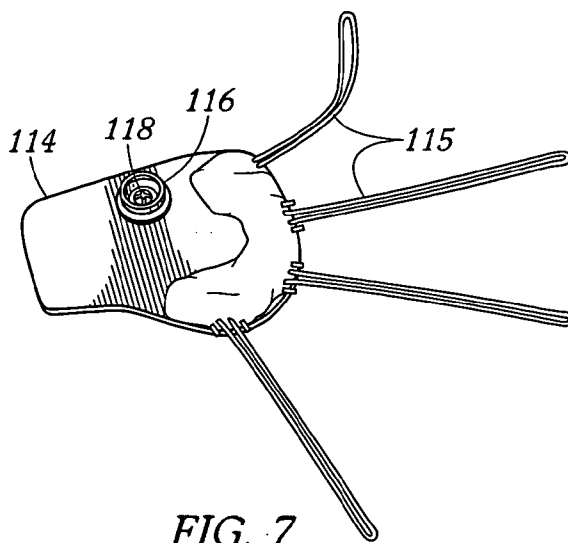


FIG. 7

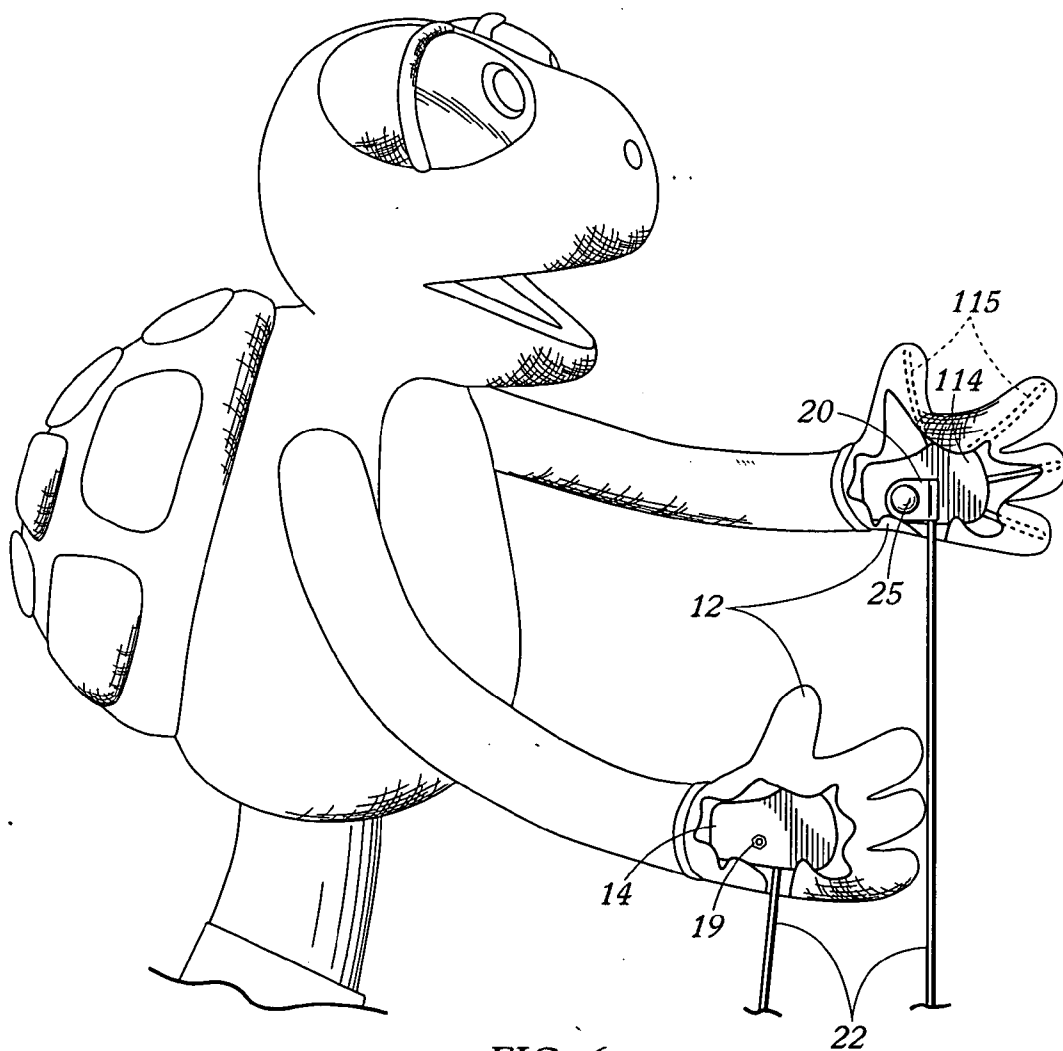


FIG. 6

**SYSTEM AND METHOD FOR  
THREE-DIMENSIONAL ANIMATION OF  
ROD-ARM PUPPET EXTREMITIES**

**BACKGROUND OF THE INVENTION**

**[0001]** 1. Field of the Invention

**[0002]** The present invention relates generally to puppets commonly referred to as rod-arm puppets; and, more particularly, to a method and system for removably securing a control rod to the extremity of a rod-arm puppet to allow natural, three-dimensional movement of the extremity.

**[0003]** 2. Description of Related Art

**[0004]** A rod-arm puppet (or generically, a “muppet”) is generally known as a “puppet” type, movable doll, or three-dimensional figure that is manipulated by a puppeteer with at least one hand inside the puppet used to operate an opening and closing mouth and at least one control rod for operating at least one flexible extremity. Over the past 60 years, these puppets have become increasingly popular. These doll-like, entertainment figures or devices, sometimes referred to as muppets (a combination of “marionette” and “puppet”), were more recently made famous by Jim Henson and the Jim Henson Company and have become very popular in a number of venues.

**[0005]** A rod-arm puppet is distinguished from ventriloquist “dummies”, which are typically animated only in the head and face, in that rod-arm puppets arms or other features are also mobile and expressive. Rod-arm puppets are typically made of softer materials. They are also presented as being independent of the puppeteer, who is usually not visible, hidden behind a set or outside of the camera frame. Rod-arm puppets are distinguished from a “marionette” which is typically animated from above by strings. Rod-arm puppets are also distinguished from a “stick puppets” which has rigid jointed extremities and is actuated by manipulation of a single rod connected to the back torso of the device, and its mouth does not move.

**[0006]** The most common design for a rod-arm puppet is a character with a very wide mouth and large protruding eyes. The puppets are typically molded out of polyfoam, and then covered with felt or artificial fur. Yarn, nylon string, or, most commonly, artificial feathers are used to create hair.

**[0007]** In operation, the puppeteer typically holds the puppet above his head or in front of his body, and operates the hands and arms with a control rod. One consequence of this design is that most rod-arm puppets are left handed as the puppeteer uses his right hand to control the face, and the control rod is operated by the left hand. There are many other common designs and means of operation. In advanced rod-arm puppets, several puppeteers may control a single character; the performer who controls the mouth usually provides the voice for the character. As technology has evolved, the Jim Henson team and other puppeteers have developed an enormous variety of means to operate puppets for film, including the use of suspended rigs, internal motors, remote radio control, and computer enhanced and superimposed images. This has allowed for scenes in which a rod-arm puppet, for example, appears to be riding a bicycle.

**[0008]** The control rod is a distinguishing feature of a rod-arm puppet and controls one or more extremities, usu-

ally the hands. Since the arms and legs of the figure are flexible, control rods attached to the hands give the figure “extremity animation.” Previously, control rods have been attached in a number of less than desirable ways, usually to the wrist or ankle. Rod attachment designs have remained essentially static since the inception of these puppets.

**[0009]** The standard for rod-arm puppet arm manipulation has been a rod with a securing device externally attached (elastic, plastic cable ties, etc.) to the wrist of the puppet. One end of the rod is secured under the securing device at the puppet’s wrist joint. The opposite end is held by the puppeteer. This yields the characteristic “floppy hands.” Other disadvantages of this system include: damage to the puppet’s external fabric; compression damage to wrist materials; rod arm disconnection during inappropriate times such as live performance; limited range of motion of the extremity; a visually detectible wrist bracelet of elastic (the securing device); anatomically inaccurate arm positions (distorted). One advantage is that these prior art devices are detachable.

**[0010]** Semi-permanent and/or permanently attached rods are also available. They require a device such as an alligator clip implanted into the puppet’s wrist. This method, however, has its own disadvantages including eventual fabric damage at site of insertion; rod arm disconnection during inappropriate times such as live performance; limited range of motion of the puppet hand, wrist, arm, and shoulder joints. The prime disadvantage is lack of motion in two independent planes, i.e. normal anatomical movement. Because the attachment of the control rod is stationary, all movements are in an arc about the rod connection. This makes the animation stilted (unnatural) with the hands (feet) “flopping” uncontrollably. In addition, the fingers on the hand are of cloth which makes them “flop” and prevents hand expressions using the fingers.

**[0011]** Many web sites, dedicated to muppets, carry long recitations on the various ways of attaching the control rod to the extremities. Many have given extensive thought to the problem with the evolution of very exotic and complicated devices. One such device is contained in recently issued U.S. Pat. No. 6,663,312 issued on Dec. 16, 2003 to Cary, et al. In this device a thin, firm material base contains a slotted tube and attached clip inserted through the base and secured to the base with bolt retainers. The bolt retainers keep the tube secure within the base. The base is encased in a split cylindrical foam material to provide for support, shape and proper alignment when used in an internal application such as a puppet wrist. In addition, a rod with a ground end can be temporarily inserted into the tube and attached clip assembly, providing a temporary, yet secure connection while allowing for rotational movement of the rod within the tube. The temporarily secure connection is a result of the friction of the inserted rod coming into contact with the straight side of the clip within the interior diameter of the tube. For the temporary secure connection to take place, the rod must be inserted into the tube past the point of engaging the straight side of the clip within the interior diameter of the tube. The connection can be disengaged by grasping and pulling the rod out of the tube, thus releasing the friction between the clip and the rod. This device still does not provide natural three-dimensional movement causing the extremity movement to appear jerky.

[0012] Thus, hand-held puppet rod-arm technology has been in need of advancement beyond straight wire and rubber bands for decades. None-to-date have afforded true three-dimensional movement while being detachable, regardless of how complicated the design. As can be seen by the recitation above, the most recent devices are at the very least complicated, if not cumbersome and restrict movement. Therefore, it would be advantageous to have a system and method for detachable, secure attachment of a rod-arm to the extremity of a rod-arm which is simple, inexpensive and allows an expanded three-dimensional range of motion that is more realistic. Specifically, a system which provides movement of the puppet extremity in a vertical plane while the rod remains vertical; and, in a horizontal plane while the rod remains vertical. It would be further advantageous to have a rod-arm puppet connection system that does not deteriorate the materials or fabric of the puppet arm; does not cause compression of the wrist joint; does not employ an external bracelet or other securing device that detracts visually; that can be intentionally disconnected as needed, but cannot become disconnected without intent; and, importantly, a system to provide a naturally positioned arm and hand movement without canting or skewing the control rod during operation, i.e. no jerky movement or “floppy hands”.

#### SUMMARY OF THE INVENTION

[0013] In accordance with the invention, there is provided an easily installed and inexpensive system and method for detachably securing a control rod to the extremity of a rod-arm puppet which provides the ability to engage in natural three-dimensional extremity movements. The system allows for a secure, detachable attachment that is capable of swiveling movement, in two planes, simultaneously, to provide 3 degrees of freedom. Thus, the system, although very secure during use, is easy to disconnect for storage. In addition, the method of securing is virtually invisible with all connection and disconnection activity occurring at one very small point internal the puppet hand and/or foot. This allows the puppet wrist joints to remain essentially untouched and eliminates visual distraction and “floppy hands”.

[0014] In accordance with the invention, a system for detachably securing a control rod to the flexible extremity of a rod-arm puppet in a manner to allow true, natural three-dimensional extremity movements is provided. The system includes a first, more or less rigid, support structure attached to the interior of the extremity proximate the distal end of the extremity (for example, the hand or foot) which carries, securely mounted thereon, the stud portion of a mechanical fastener; and, a control rod having fixedly attached, proximate its distal end, a second flexible support member carrying the closure portion of the mechanical fastener such that the system provides rotational movement in two planes simultaneously, as well as means for detaching the control rod from said extremity for transportation and/or storage.

[0015] In accordance with invention, the stud portion and the closure portion of the mechanical fastener can be reversed such that the closure is fastened to the first support structure within the distal end of the extremity, and the stud is carried by the second flexible support attached to the distal end of the control rod. The second flexible support member is fastened to the control rod such that the closure portion is able to rotate greater than 90° about the longitudinal axis of

the control rod. Advantageously, the stud is attached to said first and/or second support structure by means of a mechanical anchor, an adhesive, or the like and the second support which is flexible comprises leather, stiffen cloth or the like. In an advantageous embodiment, the mechanical closure is a snap fastener employing a stud and socket closure wherein the stud is immovably affixed to the first support inside the palm of the puppet, beneath the material covering. In a further embodiment, the first support member carries thereon a number of outstanding, bendable members, such as, for example, sculpture wire, which extend into the cloth fingers in the hand of the puppet. In accordance with this embodiment, these bendable members can be formed so that the puppet hands can, for example, point or grasp an object.

#### BRIEF DESCRIPTION OF THE FIGURES

[0016] The objects, features, and advantages of the present invention will be apparent to one skilled in the art, in view of the following detailed description in which:

[0017] **FIG. 1** is a front cutaway view showing the first supporting structure containing the stud, attached thereto, interior the hand of the puppet in accordance with the system of the invention;

[0018] **FIG. 2** is a rear view of the cover portion of the closure element of a snap fastener affixed to the second flexible support which, in turn, is fixedly attached to the control rod in accordance with the system of the invention;

[0019] **FIG. 3** is a front view of the socket portion of the closure element of a snap fastener affixed to the second flexible support which, in turn, is fixedly attached to the control rod in accordance with the system of the invention;

[0020] **FIG. 4** is side view of the system of the instant invention showing the two elements of the snap fastener in the unsnapped or open configuration as supported on the first and second support structures;

[0021] **FIG. 5** is side view of the system of the instant invention showing the two elements of the snap fastener in the snapped or closed configuration as supported on the first and second support structures;

[0022] **FIG. 6** is an illustration of a rod-arm puppet showing a cut away of the attachment system in use according to the invention with the ridged support of **FIG. 7** shown in cutaway and phantom on the puppets left hand; and,

[0023] **FIG. 7** is an illustration of an alternative embodiment of the first support structure having formable, outstanding finger support members and supporting the stud portion of the snap fastener.

#### DETAILED DESCRIPTION OF THE INVENTION

[0024] The instant invention provides an inexpensive easily installed method and system for secure animation and movement of the extremities of a rod-arm puppet in two rotational planes. In accordance with the invention, rotational movement is provided between the control rod and the extremity in two planes giving the extremity three degrees of motion or freedom. Thus, unlike prior art systems (even those of complicated design), the system of the instant invention allows the appearance of smooth continuous movement of the puppet extremity, independently, in three-

dimensions without jerkiness or “floppy hands” (feet) or the arcing movement of prior art devices. In addition, the mechanical fastener allows easy detachment of the rod from the extremity for transportation and/or storage, yet provides secure rotational engagement of the rod and the extremity during performance.

[0025] A first rotational plane is provided by the rotation of the mechanical fastener closure element about the fastener stud element to provide continuous “up” and “down” movement of the extremity about the connecting joint (e.g. shoulder) while allowing the control rod to remain vertical giving a life-like appearance to the motion. Further, the closure element of the mechanical fastener is attached to a flexible second support element which is fixedly attached to the control rod to provide at least 90° of rotational movement of the closure element about the control rod, thus allowing natural forward and back movement of the extremity while maintaining the control rod vertical. Thus, rotational movement about these two perpendicular planes allows life-like, three-dimensional motion heretofore not possible with prior art systems.

[0026] Thus, as can be seen, in moving a puppet arm, for example, any position of the arm in an arc defined from the shoulder to the hand is capable of attainment while the control rod remains substantially vertical in respect to the extremity. Even when the control rod is canted due to the rotational degrees of freedom afforded by the instant inventive system, the extremity remains in a natural position. As can be seen, all positions to the front and rear of the puppet torso in combination with those above the head to the extreme down position are provided for. Thus, as opposed to prior art devices, the instant invention provides natural, non-jerky extremity movement of the extremities of a control rod puppet. By allowing 90° of rotational movement of the closure element about the control rod, to hands naturally move inward toward the body to allow the hands to rest naturally on the chest. Surprisingly, this simple and inexpensive attachment and movement system overcomes substantially all of the problems with such devices (even complicated ones) in the prior art. Additionally, all fastening means are contained interior of the covering, such that no visible means of connection is apparent to a viewer. This is extremely important in providing a “life-like” performance.

[0027] Further, the first support member can carry a number of outstanding, formable (bendable) members corresponding to fingers or toes. These members are cable of being bent into a configuration and have sufficient retention of the deformation to allow, for example, phalanges gesturing, or functional grasping of an object, such as a stick or a flashlight.

[0028] The system of the instant invention is fully displayed as used on a rod-arm puppet in FIG. 6. The system of the instant invention with the connectors in position and having certain puppet portions cutaway for explanatory purposes is shown. Within the left hand (in phantom) is a support member carrying outstanding deformable “finger” members to give rigidity to the puppet cloth fingers for gesturing, grasping and the like. These features will be further described, in detail, below. Turning specifically to FIG. 1, there is shown in detail the cutaway of the hand portion of the rod-arm puppet of FIG. 6. The puppet hand 12 is shown, in cutaway, containing a substantially rigid first

support structure 14, embedded within the hand, upon which is mounted the stud element 16 of a mechanical snap fastener 11 (see more detail in the view in FIG. 4). The stud element 16 is secured to the first rigid support structure 14 by means of, for example, a screw fastener 18. The stud element 16 may also be secured to the first rigid support structure 14 by means of a nut and bolt fastener 19 as better seen in FIG. 6.

[0029] Turning then to FIG. 2, there is shown the cover 25 of the closure element of the snap mechanical fastener 11 mounted on a second, flexible support member 20 which gives the closure limited rotational freedom (as shown by arrow 27) about the control rod 22. Specifically, the second flexible support member 20 is fixedly attached to the control rod 22 in a manner such that the second flexible support member 20 flexes or bends in an arc, greater than about 90°, in rotational relation to control rod 22.

[0030] As better seen in FIG. 3, the socket portion 24 of the closure element is supported within the open portion of second flexible support member 20, as shown. As shown in FIG. 4, the closure member comprises a socket portion 24 and a cover portion 25. The socket portion 24 rotationally engages stud element 16. This allows the closure element to rotate in an arc about the stud element 16 as indicated by arrow 26 as well as the control rod 22 as indicated by arrow 27 by bending or flexing the second flexible support member 20.

[0031] As further seen in FIG. 4, there is shown a side view of the inventive system in the detached or open position showing the aligned, detachable engagement of the snap fastener and the rotational relationship of the closure element relative to the control rod 22. First rigid support structure 14 supports the stud element 16 of a standard mechanical snap fastener 11. Control rod 22 fixedly attaches to the second flexible support member 20 containing the closure element of the standard mechanical snap fastener 11, as previously described. As can be seen, when the socket portion of closure element 24 of the standard mechanical snap fastener 11 rotationally engages stud element 16, the snap fastener 11 is capable of rotation about the main axis of stud element 16, as shown by rotational arrow 26.

[0032] FIG. 5 is a side view of the inventive system in the attached or “snapped” (closed) position showing the engagement of the snap fastener and the rotational relationship of the closure element relative to the control rod 22. First rigid support structure 14 supports the stud element 16 of a standard mechanical snap fastener 11. Control rod 22 fixedly attaches to the second flexible support member 20 containing the closure element of the standard mechanical snap fastener 11. In this manner, the engaged mechanical snap fastener 11, and thus the puppet extremity is capable of rotational movement in an arc (as shown by arrow 27) about control rod 22. As is indicated by rotational arrow 26, the socket portion of closure element 24 of the standard mechanical snap fastener 11 rotationally engages stud element 16 such that the mechanical snap fastener 11 is capable of rotation about the main axis of stud element 16. This gives rotational movement in two planes affording natural, three-dimensional movement of the extremity by manipulating the control rod.

[0033] Thus, as can be seen, the system of the instant invention not only provides for easy attachment and detach-

ment by engagement of the socket portion **24** of the closure member to stud element **16** in a standard fashion, but the system also provides two degrees of rotational freedom about the connection to provide a full three-dimensional range of extremity motions as previously described in detail.

[0034] This system advances the art of control rod puppetry to a new level. The first rigid support structure **14** embedded inside the hand (foot), (**FIG. 1**), provides the connection requirement between the control rod **22** and puppet arm. This is accomplished in a hidden manner, thus giving the puppet arm a natural look. The first rigid support structure **14** provides stiff support for the stud element **16** of the standard mechanical snap fastener **11**. Any rigid material to scale could serve as the first support structure **14** such as metal, plastic, resins, or the like. The stud element **16** is secured to the first support structure **14** using any appropriate mechanical fastener or adhesive such as "super glue" to establish a permanent bond. Examples include screw fasteners, nut and bolt fasteners, compression brads, and the like, as well as compression type bonding adhesives, glues, and mastics.

[0035] The mechanical snap fastener **11** can be any known in the art, which provides rotational freedom of the closure element about the stud element. The material used in the fastener can comprise metal, plastics of various sorts, epoxies, resins and the like. The second flexible support member **20**, which is fixedly attached to the control rod **22**, can be any flexible material, which allows arcing of the socket portion **24** of the closure member of the mechanical snap fastener **11** about the control rod. Examples include leather, synthetic fabric, or very Low Density Polyurethane. The second flexible support member **20** is attached to the control rod **22** by, for example, adhesives, glues, mastics, and the like. The socket portion **24** of the closure member of the mechanical snap fastener **11** is securely anchored into the second flexible support member **20** in a standard fashion such as perforation, adhesives, mastics, and the like, such that the socket portion **24** of the closure member is accessible to rotationally engage the stud element **16**.

[0036] The standard mechanical snap fastener **11** provides a detachable secure connection between the control rod **22** and the puppet hand **12**, yet allows rotation of the control rod **22** relative to the puppet hand **12** in a first plane (up and down). This prevents unwanted disconnects. Likewise, the second flexible support member **20** which is flexible about the fixed connection between the control rod **22** and the second flexible support member **20**, allows rotation of the control rod **22**, relative to the puppet hand **12**, in a second plane (forward and back) in an arc of greater than 90°.

[0037] Thus, the system of the instant invention provides unrestricted natural movement between the control rod **22** and the puppet hand **12**. The first support element **14**, which is hidden inside the puppet hand **12**, provides support and shape for the puppet hand **12**, as well as assuring proper placement of the stud element **16** of the mechanical snap fastener **11**. In a further embodiment the first support element **14** contains a number of outstanding elements as shown in **FIG. 7**. **FIG. 7** shows substantially rigid first support structure **114**, which is adapted to be embedded within the hand (as shown in **FIG. 6**), upon which is mounted the stud element **116** of a mechanical snap fastener. The stud element **116** is secured to the first rigid support

structure **114** by means of, for example, a screw fastener **118**. The stud element **116** may also be secured to the first rigid support structure **114** by means of a nut and bolt fastener, as previously described. The substantially rigid first support structure **114** carries, at one end thereof, four outstanding, deformable members **115**. These members allow the fingers on hand **12** to have rigidity yet are capable of being deformed as shown in **FIG. 7**. The members **115** can be constructed of any easily deformable material which has substantially no memory, such as, for example, sculpture wire or the like. The number of outstanding, deformable members **115** is a matter of choice. This aspect of the instant invention allows the puppet to point, make gestures using the fingers or toes, and grasp objects such as a dog leash, a baton, a flashlight, or the like.

[0038] All of the methods and systems disclosed and claimed herein can be made and executed without undue experimentation in light of the present disclosure. While the methods and systems of this invention have been described in terms of embodiments, it will be apparent to those of skill in the art that variations may be applied to the methods and systems and in the steps or in the sequence of steps of the methods described herein without departing from the concept, spirit, and scope of the invention. Various substitutions can be made to the hardware and software systems described without departing from the spirit of the invention. All such similar substitutes and modifications apparent to those skilled in the art are deemed to be within the spirit, scope, and concept of the invention as defined by the appended claims.

What is claimed is:

1. A system for three-dimensional animation of rod-arm puppet extremities comprising:

- a.) a mechanical fastener having two rotationally connecting elements comprising a stud element and a closure element;
- b.) a first rigid support member attached internal the distal end of the extremity to be animated carrying thereon one element of said mechanical fastener;
- c.) a second flexible support member fastened about the circumference of the distal end of a control rod carrying thereon the other element of said mechanical fastener such that the other element can arc about the control rod.

2. The system of claim 1 wherein said mechanical fastener is a snap fastener.

3. The system of claim 1 wherein said first support member carries said stud element and said second flexible support member carries said closure element.

4. The system of claim 1 wherein said first support member carries said closure element and said second flexible support member carries said stud element.

5. The system of claim 1 wherein the extremity to be animated is an arm having a hand and said first rigid support member is attached interior the puppet hand.

6. The system of claim 1 wherein the extremity to be animated is a leg having a foot and said first rigid support member is attached interior the puppet foot.

7. The system of claim 1 wherein said first rigid support member further comprises at least one outstanding, deformable member attached to one end of said first rigid, support member.

8. The system of claim 1 wherein said first rigid support member further comprises at least four outstanding, deformable members attached to one end of said first rigid, support member.

9. The system of claim 5 wherein said first rigid support member further comprises at least one outstanding deformable member attached to one end of said first rigid, support member.

10. The system of claim 6 wherein said first rigid support member further comprises at least one outstanding deformable member attached to one end of said first rigid, support member.

11. A method for three-dimensional animation of rod-arm puppet extremity comprising:

- a.) animating said extremity up and down relative to the vertical axis of puppet by means of a mechanical fastener having two rotationally connecting elements comprising a stud element and a closure element wherein a first rigid support member, attached internal the distal end of the extremity to be animated, carries thereon one element of said mechanical fastener;
- b.) animating said extremity back and forth relative to the vertical axis of puppet by means of a second flexible support member fastened about the circumference of the distal end of a control rod carrying thereon the other element of said mechanical fastener such that the other element can arc about the control rod.

12. The method of claim 11 wherein said mechanical fastener is a snap fastener.

13. The method of claim 11 wherein said first support member carries said stud element and said second support member carries said closure element.

14. The method of claim 11 wherein said first support member carries said closure element and said second support member carries said stud element.

15. The method of claim 11 wherein the extremity animated is an arm having a hand and said first support member is attached interior the puppet hand.

16. The method of claim 11 wherein the extremity animated is a leg having a foot and said first support member is attached interior the puppet foot.

17. The method of claim 11 wherein said first rigid support member further comprises at least one outstanding deformable, member attached to one end of said first rigid, support member.

18. The method of claim 11 wherein said first rigid support member further comprises at least four outstanding deformable, members attached to one end of said first rigid, support member.

19. The method of claim 17 wherein said first rigid support member further comprises at least one outstanding deformable member attached to one end of said first rigid, support member.

20. The method of claim 17 wherein said first rigid support member further comprises at least one outstanding deformable member attached to one end of said first rigid, support member.

\* \* \* \* \*