Dec. 28, 1937. R. K. BROWN 2,103,511

ARTIFICIAL BODY MEMBER AND METHOD OF MAKING THE SAME

Filed April 22, 1936 2 Sheets-Sheet 1

Fig. 1.

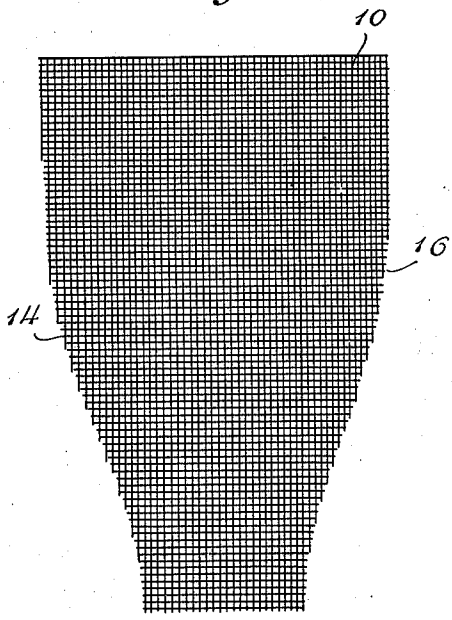


Fig. 2.

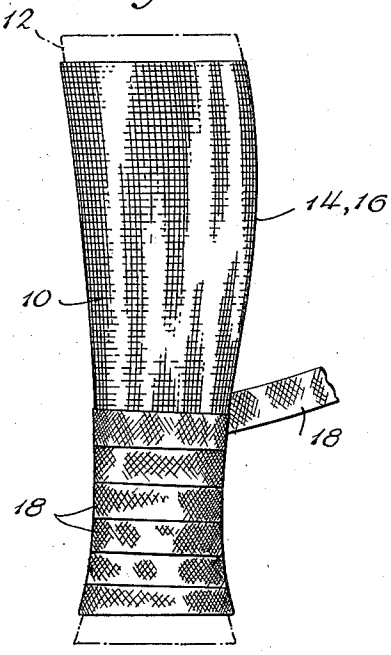


Fig. 3.

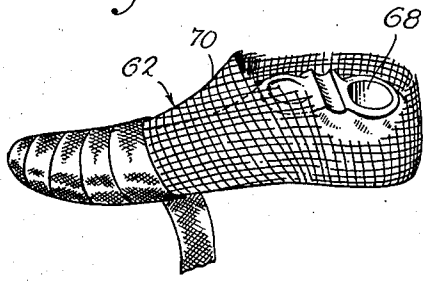


Fig. 4.

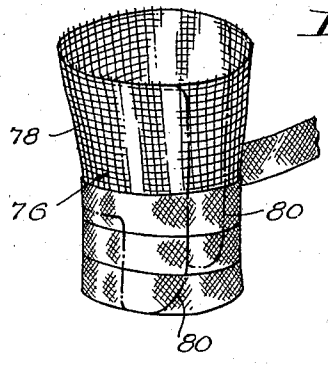
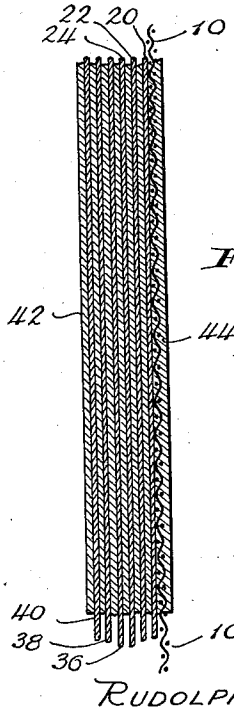


Fig. 5.



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Filed April 22, 1936 2 Sheets-Sheet 2

Fig. 6.

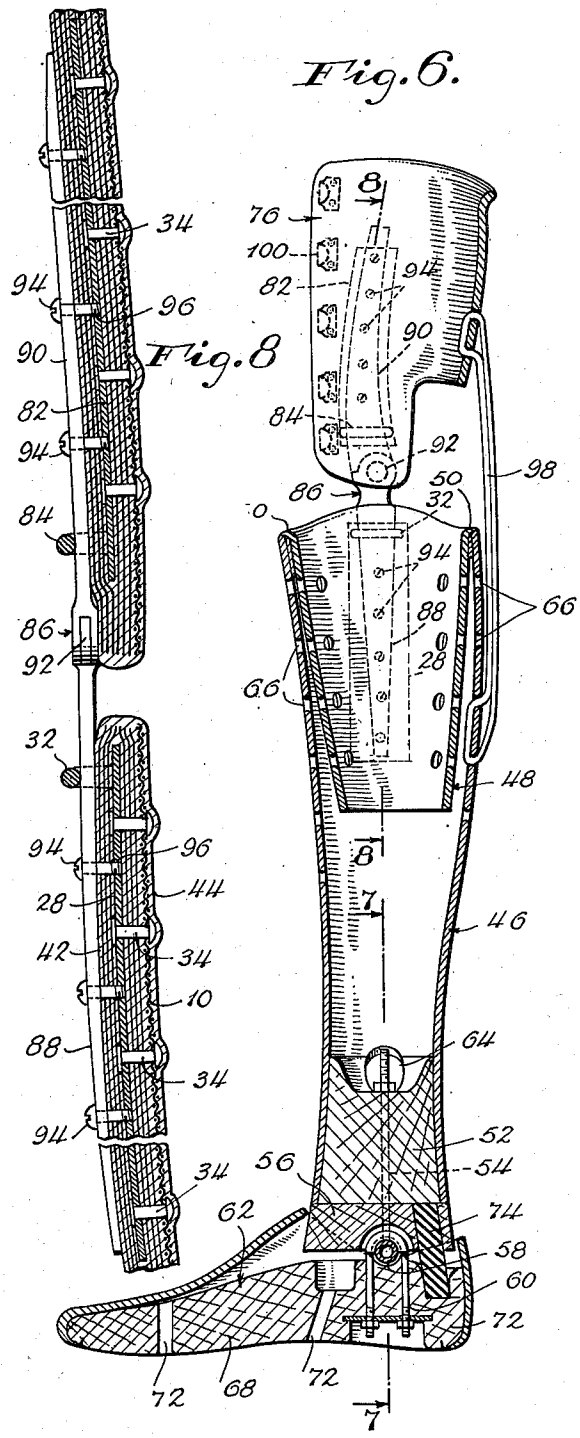
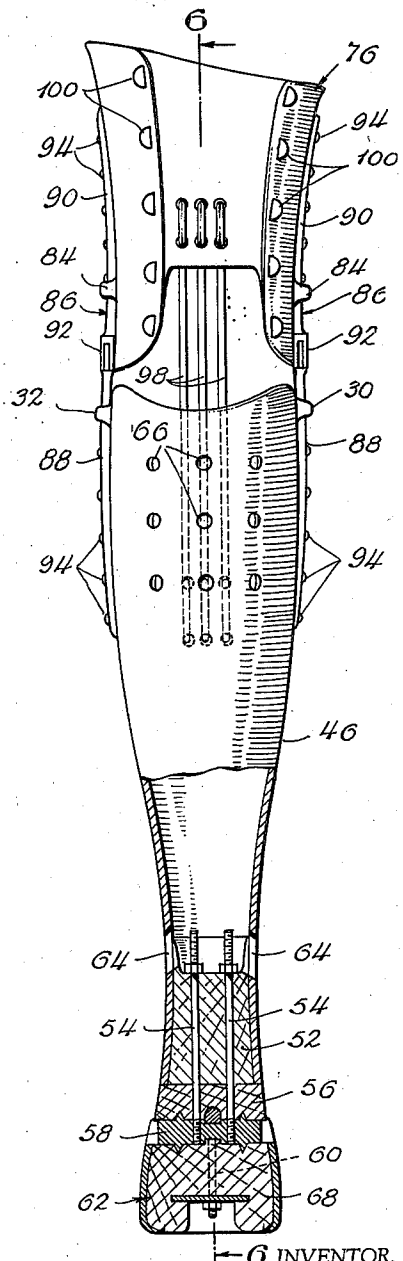


Fig. 8

Fig. 7.



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ARTIFICIAL BODY MEMBER AND METHOD OF MAKING THE SAME

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Application April 22, 1936, Serial No. 75,676

7 Claims. (Cl. 3—2)

My invention relates to improvements in artificial body members and the method of making the same.

One of the objects of my invention is to provide an improved construction for and method of making an artificial body member which has advantages over those proposed heretofore residing in the fact that the members are waterproof and can be worn in the water as long and as often as might be desired without resulting in any damage to or impairment of operation of the member, as has been the case with the various prior constructions.

Another object of my invention is to provide an improved construction for an artificial body member which can be made economically and to suit any particular requirements or specifications, and which is strong, durable, sanitary and relatively light.

Other objects and advantages will hereinafter appear.

For the purpose of illustrating my invention, an embodiment thereof is shown in the drawings, wherein;

Figure 1 is a plan view of the reinforcing body part from which an artificial shin is built up;

Fig. 2 is an elevational view, illustrative of the manner in which an artificial shin is built up from the reinforcing base part in Fig. 1;

Fig. 3 is a perspective view, illustrative of the manner in which an artificial foot is built up in accordance with my invention;

Fig. 4 is a perspective view, illustrative of the manner in which an artificial thigh or corset is built up in accordance with my invention;

Fig. 5 is an enlarged, fragmentary, diagrammatic view, illustrative of the various steps in the method of making my improved body members;

Fig. 6 is an elevational, sectional view of a complete artificial leg comprising the various parts made in accordance with my invention, the section being taken on the line 6—6 in Fig. 7;

Fig. 7 is an elevational view, partly in section, the section being taken on the line 7—7 in Fig. 6; and

Fig. 8 is an enlarged, detailed sectional view, the section being taken on the line 8—8 in Fig. 6.

With reference now to the drawings, an artificial shin is built up and constructed in accordance with my present invention by first cutting out a piece 10 of hardware cloth or woven metal mesh to substantially the shape shown in Fig. 1, which piece constitutes the reinforcing body from which the member is built up. For this purpose, it is proposed to use one-quarter inch mesh. The piece 10 is then applied to a wooden form 12 as shown in Fig. 2, and reaches around the form and is clamped thereto and molded about the same with the hands and a light hammer. By means of suitable tongs, the wire mesh is pulled together at the adjacent edges 14 and 16, and the surplus material is lapped over to insure a close fit. The wire mesh is lapped over to form a seam, as might be required to make the mesh conform exactly to the shape of the wooden form 12, and the seam is held together with staples.

The molded metal mesh is then opened at the adjacent edges 14 and 16 and removed from the wooden form 12, after which it is returned to the desired shape and the adjacent edges 14 and 16 secured together.

The body member 10 of wire mesh is then wrapped or bound with gauze such as bandage roll. By cutting the strips 18 on the bias, the edges thereof are caused to lie close to the metal mesh. In this way, the wire mesh body 10 is provided with a first wrapping 20 of gauze.

The next step in my improved method consists in dipping the wrapped wire mesh body 10 into a solution of acetone containing pyridine C_5H_5N and lampblack, there being about one part by weight of lampblack to ten parts by weight of pyridine. The assembly is then removed from the bath and permitted to dry. The lampblack in the bath serves the purpose of avoiding brittleness of the resulting coating when the solution dries.

Another gauze wrapping 22 is then applied, and the assembly again dipped and permitted to dry as before.

A third gauze wrapping 24 is applied and the assembly again dipped in the bath and permitted to dry.

Side bars 26 and 28, provided with the loops 30 and 32, respectively, are applied to the sides of the assembly and secured in place by rivets 34, as shown in Fig. 8.

A fourth gauze wrapping 36 is then applied, and the assembly dipped in the bath and permitted to dry, after which there follows a fifth gauze wrapping 38, another dipping and drying of the assembly, and then a sixth gauze wrapping 40.

The assembly is now dipped and dried several times to apply an outside, protective, waterproof coating 42. As a result of the various dippings, also, there is an inside coating 44 of the waterproof material.

The method of manufacture just described results in a construction comprising wrappings of gauze with layers of water-proofing material be-

tween the respective adjacent wrappings. The outside socket of the shin piece now appears as shown in Figs. 6 and 7. The inside socket **48** is made in the same manner as the outside socket, and is placed inside the latter as more clearly shown in Fig. 6, and the adjacent edges of the two sockets sealed together at **50** by applying several coatings of the water-proofing material.

A wooden plug **52** is inserted into the ankle end of the member **46** to receive bolts **54** which also pass through a shim or spacer part **56**. The lower ends of the bolts are threaded into a bearing element **58** which is associated with the part **56** as shown and about which is placed a U-shaped bolt **60** which is anchored in the foot member **62**.

Elements **54**, **58** and **60** connect the shin member **46** and the foot member **62** for pivotal movement with respect to each other about the longitudinal axis of the bearing element **58**.

The shim **56** provides for an adjustment for the purpose of shortening or lengthening the artificial leg. For example, if it is desired to lengthen the leg, the shim **56** is replaced by another one having greater thickness, as might be required.

The leg is provided with drainage openings **64** and with ventilating openings **66**.

The foot member **62** is constructed, as shown in Fig. 3, in the same manner as the shin member **46**. That is, a wooden form **68** is first made and wire mesh **70** molded and fitted around this form. The mesh is then removed and the wooden form cut down as more clearly shown in Fig. 6, to make the construction lighter without detracting from the required strength, after which the wire mesh is again applied to the wooden form **68**. The wrapping and dipping steps are then carried on alternatively until the foot member is built up to the required thickness and strength. Openings **72** are provided for drainage.

A rubber bumper element **74** is disposed between the plug **52** and the wooden form **68**, the shim **56** being drilled so that the bumper element passes through, as shown.

The corset member **76** is made up as shown in Fig. 4, in the same manner as the shin member **46** and the foot member **62**. That is, wire mesh **78** is first molded and fitted about a suitable wooden form after which it is removed from the form. The steps of wrapping and dipping are then carried on alternatively to build this part up to the required thickness and strength, after which the assembly is cut along the broken lines **80** to get the desired contour. Several coatings of the water-proofing material are then applied to finish off the piece. In constructing this part, side bars **82**, each provided with a loop **84**, are riveted in place as shown, after the third wrapping.

A knee joint **86**, of conventional construction, comprises the arms **88** and **90** pivotally connected at **92** and extending through the loops **30**, **32** and **84**. The arms **88** and **90** are secured in place by screws **94** and are threaded into tapped openings **96** in the side bars.

In making an adjustment, as required, the screws **94** are removed, and the arms **88** and **90** moved along the required distance, after which the screws are again tightened, it being understood that the spacing of the tapped openings **96** is correct to permit this.

Strands **98** of raw hide connect the members **46** and **76**, as shown, to limit pivotal movement of these members in one direction.

In making up the corset member **76**, suitable hooks **100** are riveted in place for the usual lacing to hold the corset in place about the stump.

From the foregoing it will be seen that I have provided an improved construction for an artificial body member which is waterproof, and which can be worn in the water as long as and as often as might be desired without resulting in any damage to or impairment of operation of the parts. It will be seen, further, that my improved method of construction is relatively simple and inexpensive, and makes possible the manufacture of artificial members in a comparatively simple manner and to satisfy any particular requirements or specifications.

Artificial body members made in accordance with my invention, as explained, are relatively light, durable, strong, and sanitary, and in the case of an artificial leg, can be adjusted in a simple and inexpensive manner.

It will be understood that various modifications might be made without departing from the spirit of my invention or the scope of the claims.

I claim as my invention:

1. The method of making an artificial body member which comprises shaping wire mesh to the form required, wrapping the shaped wire mesh with gauze, dipping such assembly in a water-proofing material, and repeating such wrapping and dipping steps alternately until the member is built up to the required thickness and strength.

2. As an article of manufacture, an artificial body member comprising a reenforcing body of wire mesh, a plurality of wrappings of gauze about said body, layers of water-proofing material interposed between the respective adjacent wrappings, and a coating of water-proofing material over the outside wrapping.

3. As an article of manufacture, an artificial body member comprising a reenforcing body of substantially one-quarter inch wire mesh, wrappings of gauze about said body in number of the order of six, layers of water-proofing material interposed between the respective adjacent wrappings, and a coating of water-proofing material over the outside wrapping.

4. As an article of manufacture, an artificial shin member comprising a reenforcing body of wire mesh, a plurality of wrappings of gauze about said body, layers of water-proofing material interposed between the respective adjacent wrappings, side bars each provided with a loop and with a series of tapped holes and each embedded in said member between two of the adjacent wrappings, and a coating of water-proofing material over the outside wrapping.

5. As an article of manufacture, an artificial thigh member comprising a reenforcing body of wire mesh, a plurality of wrappings of gauze about said body, layers of water-proofing material interposed between the respective adjacent wrappings, hook elements embedded in said member along the opposite edges thereof, and a coating of water-proofing material over the outside wrapping.

6. The method of making an artificial thigh member which comprises shaping wire mesh to the form required, wrapping the shaped wire mesh with gauze, dipping such assembly in a water-proofing material, repeating such wrapping and dipping steps alternately until the limb is built

up to the required thickness and strength, and cutting away a portion of such assembly to give the required configuration to said member.

7. The method of making an artificial foot member which comprises shaping wire mesh to a foot-shape block, removing the foot-shaped wire mesh, removing unnecessary portions of said block, replacing the wire mesh on said block, wrapping such assembly with gauze, dipping such assembly in a water-proofing material, and repeating such wrapping and dipping steps alternately until the member is built up to the required thickness and strength.

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