April 28, 1959 J. SOMMER 2,884,302

IMPREGNATION OF WOODEN POLES

Filed July 1, 1954 2 Sheets-Sheet 1

FIG. 1

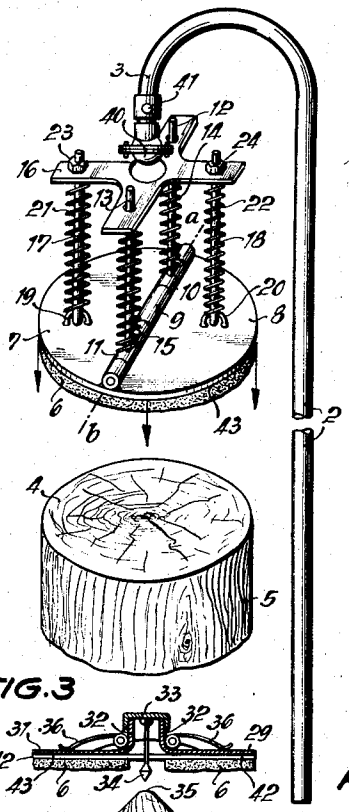


FIG. 2

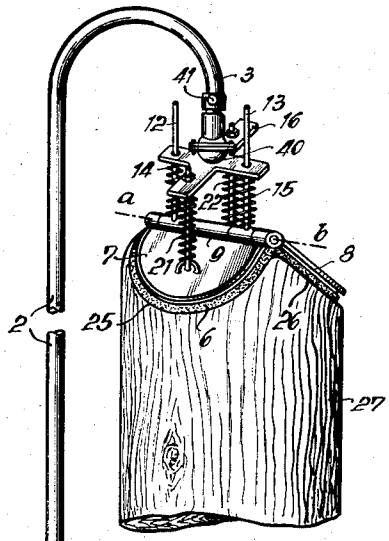


FIG. 3

FIG. 4

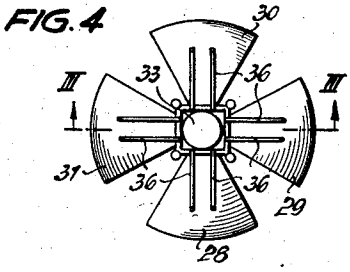


FIG. 5

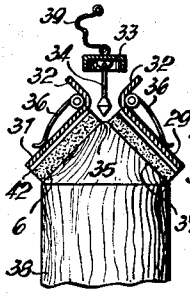
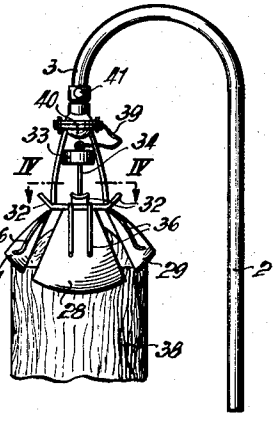


FIG. 6



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FIG. 7

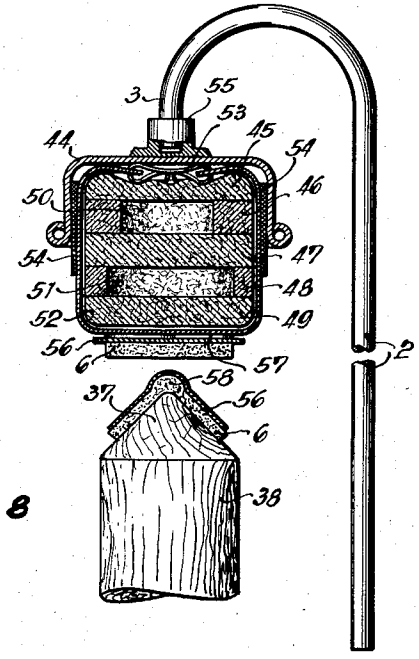


FIG. 8

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United States Patent Office 2,884,302 Patented Apr. 28, 1959

2,884,302

IMPREGNATION OF WOODEN POLES

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Application July 1, 1954, Serial No. 440,791

Claims priority, application Germany July 6, 1953

16 Claims. (Cl. 21—7)

This invention relates to improvements in the impregnation of wooden poles. The invention more particularly relates to the impregnation of wooden poles such as poles which support electric power lines, telephones, and the like, in order to keep the same in repair.

The impregnation of wooden poles for overhead electric power lines or the like before their use in order to protect the same against rot is known. It is also known to reimpregnate these wooden poles after a certain period of use in order to maintain the same in repair. This maintenance reimpregnation is particularly difficult on the high or upper portions of the pole, as, for example, at the pole top and upper end surface, inasmuch as these places are not readily accessible.

In the known processes for the maintenance of the wooden poles, the poles had to be climbed for the reimpregnation of the upper parts. For this purpose the high voltage current had to be shut off in order to avoid accidents. The shutting off of the current was highly disadvantageous and involved interruptions of the current supply, etc.

In accordance with one known method for the maintenance of wooden poles, nails were driven into the top surface of the poles with their heads protruding. The end surface of the pole was then covered with an impregnating paste, which was maintained in place by the protruding nail heads. The upper end of the pole additionally had to be surrounded with a sleeve which extended upward beyond the paste coating, and which was nailed fast around the pole.

In accordance with another known method, an end member containing the impregnation agent was nailed on the top of the pole.

These known methods, however, were too cumbersome and expensive to be practical.

It has also been proposed to pipe liquid-impregnating agents to the top surface of the pole or against some other high surface of the pole from the grounds by means of a pressure conduit connected with a liquid container. This proposal eliminates the necessity of climbing the pole. It has, however, been found that it may be necessary to also apply non-liquid wood-impregnating agents which may not be effected with the liquid conduits.

One object of this invention is the application of wood-impregnation agents to the upper end portions of wooden poles without the above-mentioned disadvantages. This, and still further objects will become apparent from the following description read in conjunction with the drawings, in which:

Fig. 1 is a perspective view of an embodiment of an apparatus in accordance with the invention showing the same just prior to the application of impregnation agent to a flat top surface of a pole;

Fig. 2 is a perspective view of the apparatus shown in Fig. 1, showing the same applying the impregnation agent to the top of a wooden pole having a wedge-shaped or gable-shaped top surface;

Fig. 3 is a partial vertical section of an embodiment of an apparatus in accordance with the invention for applying the impregnation agent to a pole having a conically-shaped top surface;

Fig. 4 is a partial plan view of the apparatus shown in Fig. 3;

Fig. 5 is a partial vertical section of the embodiment shown in Fig. 3 and positioned over the pole top;

Fig. 6 is a perspective view of the apparatus shown in Fig. 3 positioned on the pole top;

Fig. 7 is a partial vertical section of a further embodiment of an apparatus in accordance with the invention; and

Fig. 8 is a side elevation partially in section showing the impregnation agent as applied to the pole top with the device of Fig. 7.

In accordance with the invention, a pliant layer provided with the wood-impregnating agent is stuck to the upper portion of the pole, as, for example, the pole top by means of an elongated handle arrangement.

The pliant layer may, for example, consist of jute fabric, absorbent paper or the like, and preferably of crepe filter paper. The lower surface of the pliant layer is preferably provided with paste wood-impregnating agent to allow the adhesion of the same to the wooden pole. The pliant layer is preferably applied with an apparatus having an elongated handle with a reverse bend at its upper end. A hood or cap arrangement is provided at the end of the reverse bend, to which the pliant layer may be attached. The attachment of the pliant layer to the hood arrangement is effected with an adhesive force which is less than the adhesive force which will be effected between the pliant layer and the pole when the pliant layer is pressed against the pole. This, for example, may be effected by sticking the pliant layer to the hood with a smaller surface area of the same wood-impregnating paste which is used to adhere the layer to the pole.

In this manner it is possible to apply non-liquid wood-impregnating agents as, for example, wood-impregnation agents in the form of paste or coated powder to the upper end surfaces of poles or other elevated outer-pole surfaces with particular ease and speed without the necessity of the cumbersome climbing of the pole and the dangers inherent therewith. The previous cumbersome nailing arrangement is also completely eliminated in accordance with the invention and the additional expense of nails, protective sleeves, etc., is avoided.

Referring to the drawing, the apparatus shown in Fig. 1 has an elongated handle **2** in the form of a pole, such as a hollow pole or the like, with a reverse bend at its upper end terminating at **3**. A hood or cap arrangement is connected to the end **3** through a ball and socket joint arrangement **40** or any other conventional universal joint. The ball joint **40** is directly connected to the end **3** by means of a sleeve and removable pin **41**, which allows the same to be detached. The hood or cap arrangement consists of two semicircular plates **7** and **8** hinged together at the hinged joint **9**. The plates define a lower adherence surface **43**. The axis of the hinged joint **9***a*–*b* bisects the circular disc **4** by the two halves. The two halves **7** and **8** are connected to a cross-bar **16** attached to the ball and socket joint **40** by means of vertical connecting rods **17** and **18** and pivot joints **19** and **20**, respectively. The rods **17** and **18** extend through the coil springs **21** and **22**. The rods **17** and **18** may slide upwardly through the cross-plate **16** and the downward movement is limited by the nuts **23**, **24**, respectively.

The parts of the hinge **10** and **11** which are connected to the hinge pin have attached thereto the guide rods **12** and **13** which slidably extend through holes in the cross-

bar 16. Springs 14 and 15 resiliently urge the plate away from the cross-bar.

By limiting nuts 23 and 24, the hinged parts 7 and 8 are held at such a distance from the guide parts 16 that their lower surface is always in a flat plane when the plate is not placed upon such beveled pole end surfaces that their hinged parts 7 and 8 adapted themselves to the beveled pole end surfaces. If the plate shown in Fig. 1 with the hinged parts 7 and 8 is lowered in the direction indicated by the arrows onto the flat top surface 4 of the wooden pole 5, the coil springs 14, 15, 21, and 22 are compressed so that the setting on of the plate with the hinged parts 7 and 8 onto the top surface 4 of the pole always takes place in an elastic manner. If, on the other hand, the hinged parts 7 and 8 of the plate are lowered onto a gable-shaped top surface of a pole, as shown in Fig. 2, the hinged parts 7 and 8 adapt themselves to the beveled top surfaces 25 and 26 of the pole 27. This placing on of the plate with the hinged parts must, however, take place in such a manner that the axis a—b of the hinge joint coincides with the uppermost ridge edge of the gable-shaped pole top surface. When the instrument is placed on such a pole top surface, the coil springs 14, 15, 21, and 22 are not only compressed in such a manner that the placing on of the plate with its hinged parts 7 and 8 takes place in an elastic manner, but the coil springs 14 and 15 are compressed, the guide pins 12 and 13 move upwards and the coil springs 21 and 22 force the hinged parts 7 and 8 downward, as can be noted from Fig. 2 of the drawing.

The apparatus shown in Figs. 3–6, which is used for conical pole tops, has the curved hinged sectors 28, 29, 30, and 31. These hinge parts have such a curvature that they approximately fit conically-shaped pole tops. On each of the hinged parts 28, 29, 30, and 31, there is a cam projection 32. In the horizontal position of the hinge parts 28, 29, 30 and 31, a cap 33 is placed over these cam projections so that these hinge parts are held by the cap 33 in their horizontal position. The cap 33 has a downward-directed feeler 34, which, upon being placed on the tip 35 of the pole, releases the hinge parts 28, 29, 30, and 31, which are under the action of springs 36 in such a manner that these parts swing downward against the top 37 of the pole.

In Fig. 5 of the drawing, the cap 33 and the feeler 34 are shown in their raised position which is assumed when the instrument has been placed on the conical top of the pole 38. The cap 33 is preferably fastened by a holding member, for example, by a thin piece of wire 39, to the rod of the apparatus, so that it is not lost.

The handle 2, which is to be moved upward, and possibly also the instrument containing the wood-impregnating agent, can be insulated against electric current. In the event that the instrument holding the wood-impregnating agent consists of electrically conductive material, the outer surfaces of this instrument can also be insulated in the conventional manner. The coil springs 14, 15, 21 and 22 can be surrounded with rubber tubes so that these springs are not retarded with respect to their movement and are insulated on all sides from electric current.

The handle 2 can consist of collapsible and connectible parts, for example, be developed in such a manner that the handle or the rod 2 consists of parts which can be detachably connected with each other by means of sleeves known per se. However, it is also possible to form the rod of parts which can be inserted in one another or which can be connected with one another so as to obtain the length of the handle desired in each case.

In Fig. 4 of the drawing, the rod which is shown above the line C—D in Fig. 6 has been omitted in order that the parts located below same can be more readily recognized in Fig. 4.

In Figs. 4 and 6 of the drawing, the wood-impregnating agent 6 shown in Fig. 3, together with the piece of paper 42 lying over it, are not shown, so that other parts can be more readily noted.

When carrying out the method and when using paste wood-impregnating agent, a flexible layer of, for example, jute fabric, absorptive paper, or the like, and preferably a crepe filter paper of suitable size is advantageously coated at various spots on one side with wood-impregnating paste. The piece of paper 42, coated in this manner, is then applied against the lower adherence surface 43 of the apparatus, for example, below the lower surfaces 43 of the hinge parts 7 and 8 of Fig. 1, so that the piece of paper 42 adheres firmly to the same. The instrument can, in this connection, be so turned that the lower surface 43 of the hinge parts 7 and 8 lies towards the top, as, for example, by being detached from the rod 2 or the handle 2 after the pin 41 has been removed. Thereupon the piece of paper 42, which is held to the adherence surface 43 of the apparatus by the spotwise applied impregnation paste, is then provided with the paste wood-impregnating agent 6 suitable for the impregnating process in question, as, for example, with about 250 grams of such a wood-impregnating agent. The instrument is then again connected with the handle 2 and with the aid of the handle, the instrument, together with the downward-directed paste covering 6, is lowered onto the top 4 of the pole or onto some other high outer surface of the pole. Since the quantity of paste 6 of about 250 grams applied in this manner exerts a greater sticking action on the top 4 of the pole, than the smaller quantity of paste applied at individual spots between the piece of paper 42 and the lower surfaces 43 of the hinge parts 7 and 8, the instrument can be lifted from the top of the pole readily by means of handle 2, so that the wood-impregnating agent 6 remains stuck to the pole together with the piece of paper 42. The piece of paper 42 then covers the top of the paste coating 6.

In the same way conical pole tops can be provided with the paste wood-impregnating agent in accordance with Figs. 3, 5, and 6. When carrying out the process and using covered wood-impregnating agent, the surface of the covering can be coated at different spots with wood-impregnating paste, and the covering, together with its content, is then forced simply from below against the adherence surfaces 43 of the apparatus, so that the covering remains adhereing to the same. Paste is then applied to the lower surface of the covering, the quantity of the paste being such that this wood-impregnating paste holds the covering and its content firmly to the top of the pole when the apparatus is lifted off.

Crepe filter paper is preferable as the material forming the pliable layer, since it readily permits the passage of rain water therethrough while the crepe surface holds back the rain water and allows the same to trickle down slowly with sufficient time to act on the wood-impregnating agent so as to detach it. Furthermore, a crepe filter paper is relatively inexpensive.

It is advisable, when using covered powered wood-impregnating agents, to carry out the method in accordance with the invention in such a manner that the surface of the covering containing the wood-impregnating agent consisting, for example, of crepe filter paper, is bonded by a wood-impregnating paste preferably at different spots, to the lower surface or surfaces of the hood or disc of the apparatus used for the application while the other lower surface of the covering is provided with a paste wood-impregnating agent which is applied by means of the device directly to the end surface of the poles or the other high outer pole surfaces. The quantity of this latter portion of the paste wood-impregnating agent should be such that the same will remain stuck to the wood with the covering containing the wood-impregnating powder and detach from the apparatus used for the application.

In this manner it is possible to suitably apply powder and saline wood-impregnating agents in addition to wood-

impregnating paste to the upper surfaces of the wooden poles.

This mode of operation affords the possibility of combining the paste wood-impregnating agents with wood-impregnating powder or salt in a suitable manner. This is of particular importance, since the powdered wood-impregnating agents have properties which are of special advantage and which may differ from those of the wood-impregnating agents bonded with the paste. Furthermore, wood-impregnating agents or wood-impregnating salts may be introduced into the coverings which are applied with the paste in quantities readily adapted to the impregnation process in question, as, for example, by means of known filling machines having connected weighing devices. Such covered impregnating agents are particularly advantageous from a standpoint of shipment and in connection with use before the impregnation process.

Analogously, the method can be carried out with the use of the apparatus also when using molded bodies with wood-impregnating agents.

In this way the possibility is afforded of imparting the wood-impregnating agent a shape and dimension suitable for the impregnating process even without covering. For gable-shaped end surfaces, the molded product can be so developed that it is flexible on a central line. This flexibility can be achieved, for example, in the manner that the molded article is made flexible on one side for example, by a layer of jute or paper, so that it fits closely upon being applied to a beveled end surface of a pole. In the same way the molded body can also be so shaped that it adapts itself to conical pole end surfaces, it being made flexible along several central lines.

In accordance with the invention, the apparatus for carrying out the method has been further developed in the manner that the instrument arranged on the end of the rod **2** for holding the impregnating agent consists of a holder, preferably a hood, on which an elastic cushion, for example, of foam rubber, is so arranged that it rests snugly against a free pole top or some other high outer surface of the pole when placed thereon.

In this way a particularly simple device is obtained which is free of bulky parts, can be made in a simple manner, and is therefore also particularly low in price. When the instrument is placed on free pole ends or on other high pole outer surfaces, the elastic cushion, which consists, for example, of foam rubber, adapts itself in a particularly advantageous manner to these surfaces.

By such an embodiment of the apparatus, the ability of the cushion to adapt itself, particularly when placed on conical or gable-shaped pole tops, is favored.

In Fig. 7 and Fig. 8 of the drawing there is shown diagrammatically one embodiment of this device in accordance with the invention.

The device shown in Fig. 7 of the drawing has a rod **2**, on the upward extending end **3** of which an instrument holding the wood-impregnating agent **6** over the top **37** of the wooden pole **38** is arranged.

This instrument consists of a hood **44** on which there is arranged an elastic cushion, for example, of foam rubber, which consists of several elastic discs **45, 46, 47, 48,** and **49**. The elastic disc **46** is provided at its center with a recess **50** and the elastic disc **48** is provided at its center with a recess **51**, the recess **50** being smaller than the recess **51**.

The elastic discs **45, 46, 47, 48,** and **49** of the cushion are surrounded by a pliant covering **52**, which consists, for example, of soft leather, so that these elastic discs **45** to **49** are thereby held together so as to form a closed cushion. This covering **52** is held together at one end in a detachable manner, for example, by a string **53**, so that, after the removal of the string **53**, the elastic discs **45** to **49** can be removed from the covering **52** for cleaning, replacement, etc. The covering **52** can be surrounded by a sleeve **54** of flexible rubber. This sleeve **54** in this connection rests against the inner surface of the hood **44**.

The hood **44** has a coupling **55**, which serves to produce a connection, preferably a detachable connection of the hood **44** with the end **3** of the rod **2**, for example, by a suitable thread, so that the hood **44** can be screwed off.

By means of this device shown in Fig. 7 of the drawing, the method can be carried out in a particularly advantageous manner. When carrying out the method and using paste wood-impregnating agent, the crepe filter paper **56** of suitable size is preferably coated at individual spots on one side with wood-impregnating paste. The thus coated piece of paper **56** is then pressed against the lower adherence surface **57** at the lower surface of the covering **52** of the cushion, so that the piece of paper **56** adheres firmly here.

The apparatus, in this connection, can assume such a position that the adherence surface **57**, and thus also the rod **2**, are directed upwards. However, the hood **44** can also be unscrewed from the end **3** of rod **2** and the hood **44**, together with the cushion, then brought by itself into such a position that the adherence surface **57** faces upward. Thereupon, the piece of paper **56**, which is held to the adherence surface **57** of the cushion by the wood-impregnating paste which has been applied at various spots, is provided at its other side with the paste wood-impregnating agent **6** sufficient for the impregnating process in question, as, for example, with about 250 grams of such a wood-impregnating agent. The instrument is then lowered by means of the rod **2** serving as handle, with the paste covering **6** facing downward onto the end surface **37** of the pole or some other high outer surface of the pole. Since the quantity of paste **6** of about 250 grams, which is applied, has a greater adhering action to the top **37** of the paste than the smaller quantity of paste applied in individual spots present between the piece of paper **56** and the lower adherence surface **57** of the cushion, the instrument can be readily removed upwards by means of the handle **2**, so that the wood-impregnating agent **6**, jointly with the piece of paper **56**, remains adhering to the top **37** of the pole. The piece of paper **56** then covers the paste coat **6** from the top, as can be noted in Fig. 8 of the drawing.

In the same way, gable-shaped or flat tops of poles can also be provided with the paste wood-impregnating agent **6**.

In carrying out the method, and when using covered paste impregnating agents, the surface of the covering can be coated at various spots with wood-impregnating paste and the covering and its contents then simply pressed against the lower adherence surface **57** of the cushion, so that the covering remains adhering to same. To the lower surface of the covering there is then applied paste in such a quantity that this wood-impregnating paste firmly holds the covering and its contents to the top of the pole when the instrument is lifted off.

The method can be carried out analogously by means of the apparatus also when using moldings with wood-impregnated agents.

When the hood **44** is lowered with the cushion onto the free top **37** of the pole, the cushion adjusts itself elastically to this top surface of the pole. By means of the recesses **50** and **51** in the elastic discs **46** and **48**, respectively, the ability of the cushion to accommodate itself is favored, and a bead-like accumulation **58** of the paste-impregnating agent **6** is formed on the top of the pole, so that the necessary quantity of impregnating agent is also present on the top of the pole.

I claim:

1. Method for impregnating the upper exposed end of an upright wooden service pole normally requiring climbing to reach the upper portion thereof, which comprises elevating a layer of pliant material having a surface coated with wood-impregnating agent paste from substan-

tially ground level to above the top of said pole by means of an elongated handle, positioning said coated surface in contact with the top surface of said pole by means of said handle to thereby cause sticking of the coated surface and said layer of pliant material to the pole top, and withdrawing the handle, leaving the impregnating agent paste together with the layer of pliant material covering the same, stuck to the pole top.

2. Method according to claim 1 in which said layer of pliant material is a covering of pliant material containing wood-impregnating agent.

3. Method according to claim 1 in which said layer of pliant material has a shape dimensioned to fit the pole top.

4. Method according to claim 1, in which said layer of pliant material is attached to said elongated handle for said elevating and positioning by sticking the same to a surface connected to the handle at individual spots with wood-impregnating agent paste.

5. Method according to claim 4 in which said layer of pliant material is a layer of crepe filter paper.

6. Apparatus for impregnating the exposed upper end of an upright wooden service pole normally requiring climbing to reach the upper portion thereof, comprising an elongated handle of sufficient length to reach the pole top from ground level, a reverse bend at one end of said handle, a member at the reverse bent end of said handle defining a lower surface adapted to mate with the top of the service pole and removably hold a layer of pliant material having a surface thereof coated with the wood-impregnating agent paste.

7. Apparatus according to claim 6 in which said member is attached to said handle through a universal joint.

8. Apparatus according to claim 6 in which said member comprises an elastic deformable pad defining said surface and connected to the reverse bent end of said handle with said surface extending substantially normal to said handle.

9. Apparatus according to claim 6 in which said member comprises a substantially flat disc defining said surface, said disc being divided into two halves by a hinge joint allowing the disc halves to be folded toward each other.

10. Apparatus according to claim 9 including at least one rod member connected to said hinge joint and at least one rod member connected to each disc half, said rod

members extending substantially normal to the plane of said discs, a holder connecting said rod members to said handle, said rod member connected to said hinge joint being slidably mounted with respect to said holder and including spring means resiliently biasing said disc halves to their open unfolded position.

11. Apparatus according to claim 6, in which said member comprises a multiple number of wedge-shaped plates pivotably connected to and radially extending from a central member.

12. A apparatus according to claim 11 including spring means resiliently urging said wedge-shaped plates to pivot downwardly toward each other, and releasable catch means releasably holding said plates in a substantially flat plane.

13. Apparatus according to claim 12 in which said releasable catch means includes a centrally-positioned finger member extending downwardly past said central member and adapted to release said wedge-shaped plates for pivoting downwardly toward each other upon the upward movement of said finger member with respect to said central member.

14. Apparatus according to claim 6 in which said member comprises a hood connected to the reverse bent head of said handle and including a body of elastic deformable material positioned in said hood, said body having a lower substantially flat surface extending substantially normally to said handle.

15. Apparatus according to claim 14 in which said body of elastic deformable material is defined by a multiple number of elastic discs coaxially positioned one on top of the other in the form of a laminated structure, the intermediate alternate discs of said laminated structure being annular ring discs thereby forming hollow cylindrical spaces in said body.

16. Apparatus according to claim 15 in which said body is covered by a pliant covering and in which the inner diameter of the annular ring discs increases in the direction from said handle toward said surface.

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