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CONNECTOR ASSEMBLY FOR MOPS

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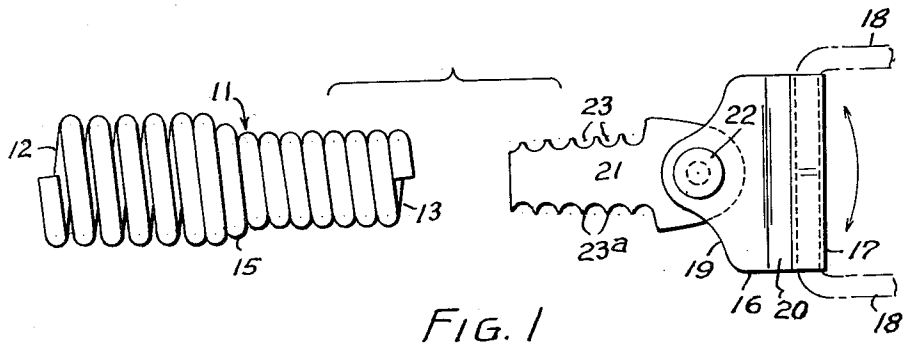


FIG. 1

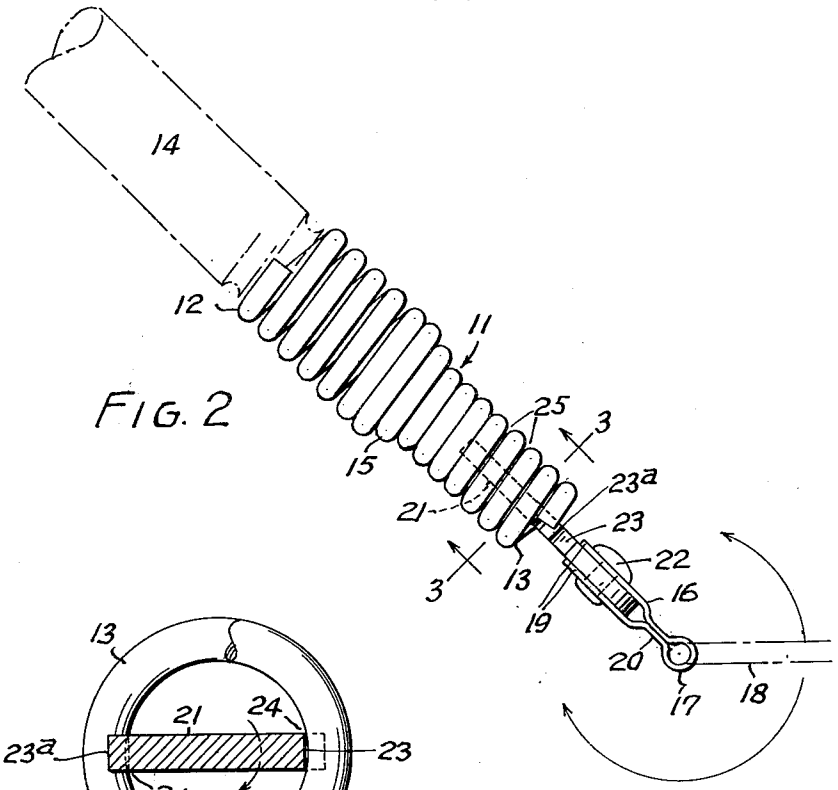


FIG. 2

FIG. 3

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CONNECTOR ASSEMBLY FOR MOPS

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This invention relates to improvements in connector assembly for mops and the object of the invention is to provide a device of this sort which will permit movement of a mop head relatively to the handle therefor in two planes normal to one another and which will remain securely in its assembled condition during use of the mop whereby the mop will not become separated from or loose relatively to the handle. A further object is to provide a device as aforesaid which is simple and durable in construction and which may be easily and inexpensively produced.

Various devices are in use or have been proposed for connecting a mop head to a handle but these all have one or more of the disadvantages of insecure connection of the mop head to the handle and undesirably limited relative movement of the mop head and the handle. The first of these disadvantages deprives the user of ability to control, through the handle, the position of the mop head, while the second deprives the user of a highly desirable range of relative positions of handle and mop head during use of the mop. Both of the aforesaid disadvantages are overcome according to the present invention.

The invention consists, broadly speaking, in provision of a mop head frame holder formed in two pivotally connected parts relatively movable in one plane, in one of which parts a mop head frame is mountable for oscillation in a plane normal to the first said plane, the other of said parts being adapted for self-locking engagement with a socket member adapted to receive an end portion of a handle.

In greater detail the invention consists in the features and combinations of features herein disclosed, together with all such modifications thereof and substitutions of equivalents therefor as are within the scope of the appended claims.

In the accompanying drawings in which illustrate that embodiment of the invention now preferred but to the details of which the invention is not limited:

FIG. 1 is a plan view of the connector assembly parts prior to final assembly thereof and shows the relation thereof to a mop head.

FIG. 2 is a side elevation of the fully assembled connector showing its relation to a mop head and to a handle.

FIG. 3 is a cross-section, on an enlarged scale, at the line 3—3 of FIG. 2.

Referring more particularly to the drawings, 11 designates a socket member formed of a helically wound spring metal wire and includes integral opposite end portions 12 and 13. The portion 12 constitutes a handle-receiving socket in which the convolutions of wire are preferably of uniform diameter and preferably slightly spaced apart and form an internal screw thread adapted for engagement with an externally threaded end portion of a handle 14. In the other end portion 13 of the socket member the convolutions of wire are preferably in close contact with one another and of uniform diameter, which may be somewhat less than the diameter of the convolutions in the portion 12. It will be understood that while the aforesaid relative diameters and spacing of the wire convolutions are convenient and desirable they are not essential. It is, however, essential that the hardness and

gauge of the wire relatively to the diameters of the convolutions thereof be such as to provide a very stiff structure. When the wire convolutions of the socket portions 12 and 13 are of different diameters, the portions are connected by an intermediate portion 15 consisting of at least one convolution which is both spiral and helical.

Associated with the socket member 11 is a mop frame holder 16, preferably formed of a single piece of sheet metal doubled on itself at a transverse zone midway between the ends of the piece to form a hollow, substantially cylindrical receiver 17, of material length, for the end portions 18 of a mop frame, and to form also a pair of spaced jaws 19. Between the cylindrical portion 17 and the jaws 19, the arms of the member 16 are offset toward one another, as shown at 20, and these offset portions are preferably substantially in mutual contact. To afford satisfactory support to the mop frame, the length of the cylindrical portion 17 should be of the order of at least eight times the diameter of the bore thereof.

A preferably flat connector plate 21 is pivotally mounted at one of its ends between the jaws 19 by means of a pivot 22 which, as shown, may be a rivet. The plate 21 extends a substantial distance beyond the jaws 19 and its opposite longitudinal edges converge from its pivoted end to its free end and are formed with approximately semicircular indents 23 separated by detens 23^a, those on one edge being in staggered relation to those on the other edge. The indented edges form, in effect, diametrically opposite portions of an interrupted screw thread. The distance apart of the two rows of indents is such that at the free end of the plate it will screw easily into the open end of the wire helix 13 while portions progressively nearer the pivot will be increasingly tight fits in the wire helix. The radius of curvature of the indents 23 is preferably slightly greater than the cross-section radius of the wire forming the member 11. Also, the pitch, or centre to centre spacing, of the indents is slightly greater than the pitch of the convolutions of wire in the portion 13 of the member 11.

It will be observed that, as viewed in FIG. 1, the axis of the pivot 22 is parallel to a vertical plane containing the axis of the cylindrical portion or frame holder 17, with result that the mop frame may be oscillated in one plane with respect to the holder 16 while the holder and mop frame together may be oscillated with respect to the connector plate 21 in a plane at right angles to the first. The amplitude of these movements may be of the order of 160° to 180° depending on limitations imposed by the size and shape of the mop and its contact with the handle when in use.

The indents 23 and detents 23^a are designed to mesh with the convolutions of wire and with the V-shaped grooves between the convolutions. When the connector plate is fully screwed into the socket portion 13, two things happen simultaneously. First, by reason of the converging arrangement and spacing of the rows of indents, the bottoms of the indents engage very tightly with the convolutions of the wire and, as the plate advances into the socket 13, expand some at least of the convolutions to larger diameter, the rotation of the plate and the movement of wire in the expanding convolutions being in the unwinding direction of the helix. The aforesaid tight engagements are concentrated at the trailing edges 24 of the plate as it is screwed into the wire helix, as shown in FIG. 3. The reflex action of the expanded convolutions of wire keeps them in very close frictional contact with the plate edges so that any tendency to unscrewing movement of the plate results in a drag on the expanded wire convolutions in the winding direction thereof with consequent urge to contract them upon the plate. Second, the greater pitch of the indents with reference to the pitch of the helix of wire results in

stretching the helix in its axial direction so that the convolutions become separated, as shown at 25 in FIG. 2, thus increasing the intensity of frictional engagement of the plate with the socket 13. The sum of these two contractile pressures of the socket on the plate locks the plate in the socket and against any loosening and against any tendency to unscrewing movement which might otherwise result from the stresses and vibration incident to the use of the mop. As result of the foregoing and of tight engagement of the mop handle in the socket member portion 12, the user of the mop is able at all times, by pressure applied to the handle, to control the relation of the mop to the handle and thus to guide the mop more advantageously than has been heretofore possible.

Although the convolutions of wire in the socket 13 have been shown and described as contacting one another when separated from the connector plate 16, this is not necessarily the case as they may be initially separated after the manner of the convolutions of the socket 12 and the indents of the connector plate have a slightly greater pitch than the wire helix, as already described, and with the effect already described when the connector plate is screwed into the socket.

Having thus described our invention, we claim:

1. A connector assembly for mops, which assembly comprises a double ended socket member formed of spring metal wound into a helix; a mop frame holder formed to support a mop frame for oscillation in one plane and a connector plate pivotally connected at one of its ends to said mop frame holder and at its other end penetrating one end portion of said socket member, the axis of said pivotal connection being disposed to permit oscillation of the mop frame holder and mop in a plane at right angles to the first said plane; the edges of said plate being formed with alternated indents and detents spaced to mesh with the convolutions of wire forming the engaged socket member portion, the indents and detents on one edge of the plate being staggered with relation to those on the other edge of the plate, said indents and detents being centered on lines which diverge from the free end of the plate toward the pivoted end thereof, the spacing and divergence of said pitch lines being such that the free end of the plate may easily be screwed into the open end of the socket and such that when the plate is fully screwed into the socket it causes diametric expansion of the wire convolutions.

2. A connector assembly for mops, which assembly comprises a double ended socket member formed of spring metal wire wound into a helix; a mop frame holder being a blank of sheet metal bent upon itself to provide a hollow, substantially cylindrical receiver for a mop frame and a pair of spaced jaws extending laterally from said receiver; and a connector plate pivotally connected toward one of its ends between said jaws and at its other end penetrating one end portion of said socket member, the edges of said plate being formed with alternated indents and detents spaced to mesh with the convolutions of wire forming the engaged socket member portion, the centre to centre spacing of said detents being greater than the center to centre spacing of the convolutions of wire in the engaged portion of the socket member whereby, upon being fully screwed into the socket member, the detents cause a separation of the convolutions of wire and an extension of the socket member in its axial direction.

3. A connector assembly for mops, which assembly comprises a double ended socket member being a helix of spring metal wire into one end of which a mop handle may be tightly fitted and normally held against rotation in the socket member; a connector plate screwed into the other end of the wire helix; a mop frame holder pivoted to the outer end of said plate and oscillatable with respect to the plate and in the plane thereof, said mop frame holder being formed with a substantially cylindrical bore disposed axially at right angles to the axis of said pivotal connection, to support a mop frame and attached mop for oscillation in a plane normal to the plane of the plate; said plate having the edges thereof formed with alternated indents and detents to mesh with convolutions of the wire and so spaced with relation to the diameter and spacing of the engaged convolutions of wire as to both expand certain of said convolutions and force them apart, thereby to effect such tight frictional engagement of the plate and socket as to secure the mop frame holder and attached mop against rotation relatively to the axis of the handle during oscillation of the mop.

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