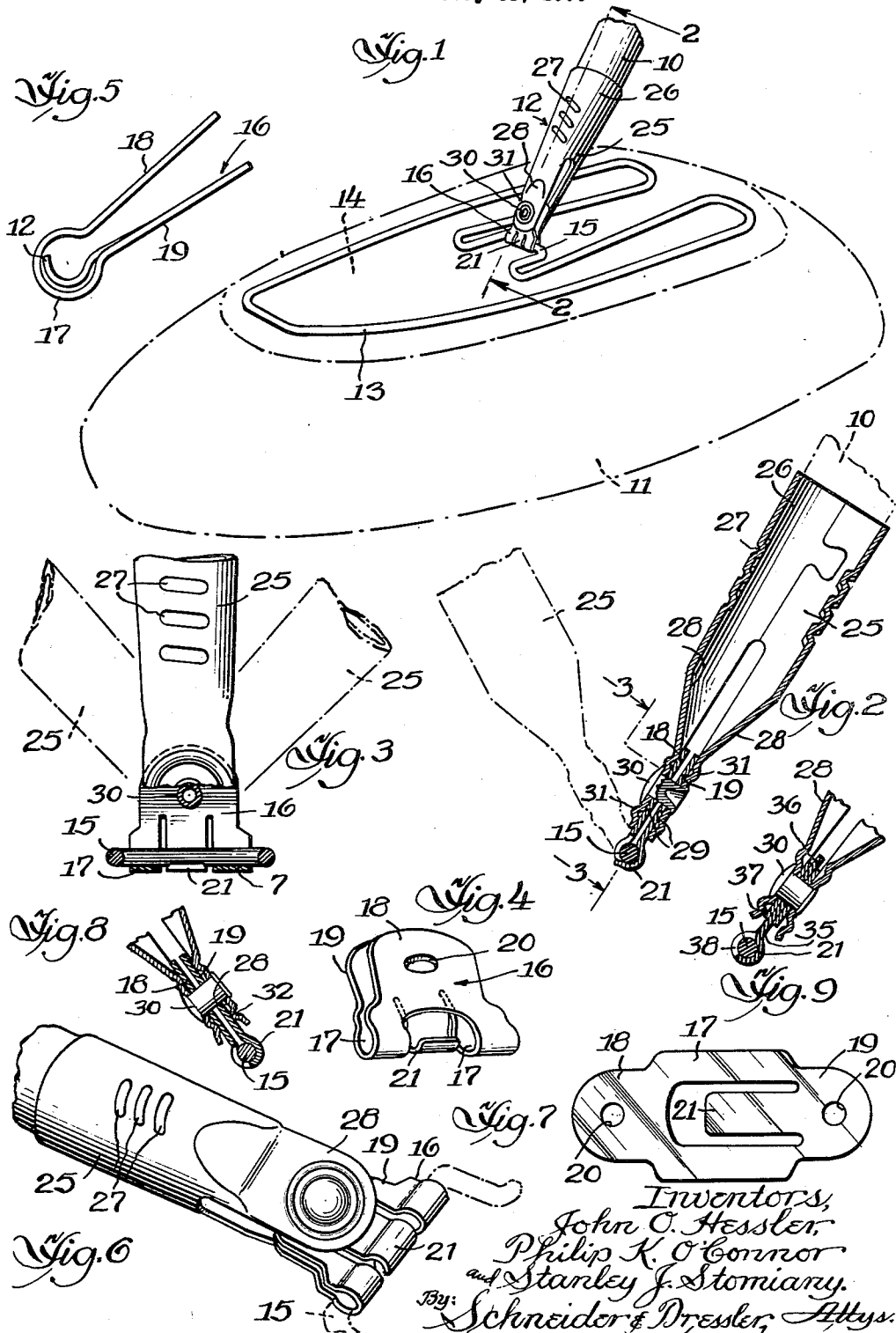


July 5, 1960

J. O. HESSLER ET AL
SWIVEL CONNECTOR FOR MOPS

2,943,892

Filed July 11, 1956



1

2,943,892

SWIVEL CONNECTOR FOR MOPS

John O. Hessler, Arlington Heights, Philip K. O'Connor, Riverside, and Stanley J. Stomiany, Chicago, Ill., assignors to American-Marietta Company, a corporation of Illinois

Filed July 11, 1956, Ser. No. 597,282

3 Claims. (Cl. 306—3)

This invention relates to a swivel connector for attaching a handle to a pivot member, and more particularly to a swivel connector which permits universal movement of the handle with respect to the pivot member and yet throughout the life of the connector provides friction of substantially constant magnitude to oppose such universal movement.

The swivel connector of this invention is especially useful for attaching a handle to a mop body. The mop bodies of mops which are used in dry condition, or for application of polish, are often elongated in shape. Thus the width of the path traced by the mop body as the mop is moved over the floor or other surface being cleaned or treated varies depending upon whether the mop body moves in its longitudinal direction or in the transverse direction.

The user of the mop varies the position of the mop handle with respect to the longitudinal and transverse axes of the mop body as he desires to move the mop in a longitudinal or a transverse direction. It will be found that the mop is most easily manipulated by the user in this way if the connection between the mop body and the handle provides considerable freedom of motion in the plane passing through the longitudinal axis of the mop body, the plane passing through the transverse axis of the body, and all intermediate positions. Obviously the shift in position of the mop handle should not demand too much force or this will be inconvenient for the user, who is most often a housewife.

At the same time, it will be found that the most accurate control of the movements of the mop body in use is provided by maintaining frictional contact between the members comprising the swivel connector as the handle is moved through its many possible positions. Moreover, this resistance must be maintained at a relatively constant value throughout the life of the connection, for if the parts become too loose the operator will find the mop body tending to flop around at the end of the handle, thus depriving the operator of a great deal of control over the movement of the mop body.

With connectors between mop bodies and handles in previous use, it has been found difficult to provide the freedom of motion which is desired and at the same time consistently maintain the optimum degree of frictional resistance in the connector. The swivel connector of this invention provides a universal movement between the handle and the mop body and at the same time, by reason of the frictional bearings employed in the connector, maintains the necessary amount of resistance to motion which provides the desired control by the operator.

Universal movement between handle and mop body is provided for in the swivel connector of this invention by two joints disposed to articulate at right angles to each other. One joint rotatably connects a portion of a pivot member (which member is affixed to the mop body) with a lower socket member of the swivel connector. A spring clamping element is positioned to press against the other portion of said pivot member, to provide a frictional re-

2

sistance to movement of the joint that continues substantially constant throughout the life of the connector. In the preferred embodiment of the swivel connector, substantially constant frictional resistance is likewise maintained in the second joint by providing spring arms biased to extend from the lower socket member so as to press against complementary friction bearing means of an upper socket in which the mop handle is received.

The invention will be described by reference to the accompanying drawings, in which:

Figure 1 is a perspective view of the swivel connector of this invention in use, with the mop body shown in phantom and the mop handle broken away;

Fig. 2 is a sectional view of the swivel connector of Fig. 1 taken along line 2—2 of the latter figure, showing the swivel connector in two operative positions, one of which is drawn in phantom;

Fig. 3 is a front elevation of the swivel connector of Fig. 1, with a partial sectional view taken along line 3—3 of Fig. 2, showing the swivel connector in three operative positions, two of which are drawn in phantom;

Fig. 4 is a perspective view of one member of the swivel connector of this invention;

Fig. 5 is a side elevation of the same member;

Fig. 6 is a fragmentary perspective view of the assembled swivel connector showing the member of Figs. 4 and 5 in operative position;

Fig. 7 is a plan view of a blank from which the member of Figs. 4 and 5 may be fabricated;

Fig. 8 is a sectional view of another embodiment of the swivel connector of this invention, similar to the view shown in Fig. 2; and

Fig. 9 is a sectional view of a third embodiment of the swivel connector of this invention.

In Fig. 1, mop handle 10 is attached to mop body 11 (shown in phantom) by swivel connector 12. Wire frame 13 is received by pocket 14 (indicated diagrammatically) of mop body 11 to provide a structure to which the mop handle may be connected. In the embodiment shown, the frame is generally H-shaped, with pivot member 15 having the position of the cross bar of the letter H.

Lower socket member 16 of swivel connector 12 is rotatably engaged with cross member 15, to permit it to pivot around member 15 with a frictional resistance to the pivoting motion produced in a manner to be explained in more detail below. As seen in Fig. 4, lower socket member 16 includes a journal portion 17 adapted to receive pivot member 15. It also has upwardly extending friction bearing arms 18 and 19, each of these being formed of a spring material (spring metal, in the embodiment shown) and normally biased to flare outwardly from each other with increased distance from journal portions 17. Each friction bearing arm 18 and 19 is apertured at 20.

In the lower socket member shown in Fig. 4, spring clamping finger 21 (formed of spring metal in the embodiment shown) extends downwardly from bearing means 19. This spring clamping element 21 is normally biased to extend into the space to be occupied by pivot member 15 when it is received in journal portions 17 of the lower socket member.

Fig. 5 shows the positions into which the normal biasing of spring arms 18 and 19 of lower socket member 16 and spring clamping finger 21 urges those members. Examination of Figs. 4, 5 and 6 together will show how spring clamping element 21 will be pressed against pivot portion 15 after the pivot member has been moved into rotatable engagement with journal portions 17 of lower socket member 16. Those figures also show how friction bearing arms 18 and 19, when compressed into the position shown in section in Figs. 2 and 8, will tend to return to their original flared positions and will thereby

3

press outwardly against the downwardly extending friction bearing arms with which they are engaged.

Looking again at Fig. 1, upper socket member 25 is seen to have an end portion 26 adapted to receive handle 10. In the embodiment shown, threads 27 (best seen in Fig. 2) receive the threaded lower end of handle 10.

Friction bearing means 28 extend downwardly from upper socket 25. As seen in Fig. 2, friction bearing faces 29 on the inner surfaces of bearing means 28 confine the outwardly flaring friction bearing means 18 and 19 of lower socket member 16 when the swivel connector is in its assembled condition.

When assembled, it is seen that swivel connector 12 permits handle 10 to move in the vertical plane through the longitudinal axis of mop body 11, in a transverse plane perpendicular to that plane, and by various combinations of such movements in a universal fashion into any position with respect to the mop body.

At the same time, connector 12 provides frictional resistance against motion of handle 10 in the vertical plane through the longitudinal axis of mop body 11 by pressure of spring clamping element 21 against pivot member 15. Likewise, pressure of friction bearing members 18 and 19 against friction bearing faces 29 on the inner surfaces of downwardly extending friction bearing means 28 provides frictional resistance against movement of the handle 10 in a plane through the transverse axis of mop body 11.

Thus, as mop handle 10 is moved so that upper socket 25 moves from the position shown in solid line to the positions shown in broken line in Fig. 3, the movement is opposed by frictional resistance which is maintained at substantially the same value regardless of the amount of wear that may take place on the outer surfaces of friction bearing means 18 and 19. In the embodiment shown, arms 18 and 19 are formed of spring metal and are biased to press outwardly from each other from the position shown in Fig. 2. It follows that as wear takes place in the pairs of friction surfaces 18 and 29, or 19 and 29, respectively, arms 18 and 19 simply press outwardly and continue the same frictional contact that was first produced when the swivel connector was assembled.

The manner in which spring clamping element 21 presses against pivot member 15 to maintain the desired frictional resistance between those members is readily seen from Figs. 5 and 6. Here again, as wear takes place in the contact between spring finger 21 and pivot member 15, the finger continues to press against member 15 because of its normal spring bias as shown in Fig. 5.

Fig. 7 shows a blank made of spring metal from which the preferred embodiment of lower socket member 16 and spring clamping element 21 may be conveniently produced. The parts of the blank from which journal portions 17, upwardly extending friction bearing means 18 and 19 and spring clamping element 21 may be fabricated by bending the blank into the shape shown in Fig. 4 are indicated in Fig. 7 by the same designators as used in Fig. 4 for the corresponding parts of the finished piece.

Fig. 8 shows another embodiment of the swivel connector of this invention having downwardly extending friction bearing means 28 adapted to produce a different kind of frictional contact from that shown in the embodiment of Fig. 2. Friction bearing means 28 in Figs. 1 and 2 are each formed with a ring 31 embossed on their outer surfaces. This provides additional strength in the lower portions of bearing means 28. In the embodiment shown in Fig. 8, however, each bearing means 28 is formed with a ring 32 embossed on its inner surface. As a result, the frictional contacts between arms 18 and 19 of lower socket member 16 on the one hand, and friction bearing surface 29 of the respective friction bearing means 28 on the other, are in the form of circles

4

having relatively large diameters. This provides better control of the frictional contacts, as it permits considerable variation in the tolerances within which the bearing means 28 fall with respect to a planar surface, without running the risk that the sole contact between the friction surfaces is a line contact in the form of a circle of small diameter.

Fig. 9 shows a third embodiment of the swivel connector of this invention. In this embodiment, the total frictional contact between downwardly extending friction bearing means 28 and the assemblage of parts between them is reduced by providing the inner surfaces of members 28 with convex surfaces.

In addition, in this embodiment lower socket member 35 has only one upwardly extending arm 36. Friction bearings 37 of any conventional type are disposed on either side of arm 36 so as to bear against the friction bearing surfaces 29 of bearing means 28. The assemblage is again maintained by a rivet 30.

Lower socket member 35 in this embodiment includes journal portions 38 at its lower end, with spring clamping element 21 in opposed relation thereto. Pivot member 15 is confined between spring clamping element 21 on one side, and journal portions 38 flanking element 21 on the other side.

The embodiments shown in Figs. 2 and 8 can be, as will be seen from those figures, especially easily and quickly assembled. The two arms 18 and 19 of lower socket member 16 are passed around pivot portion 15 of frame 13 to snap the pivot member into place within journal portions 17. In this position, spring clamping element 21 presses against portion 15, as already explained above. Arms 18 and 19 are then compressed together and slid between friction bearing means 28. Rivet 30 is moved into place and is peened over to hold the entire assembly together, with the desired pressure being exerted between the respective friction surfaces of the moving members of the swivel connector. Rivet 30 preferably serves only to provide a pivot for the joint between lower socket member 16 and upper socket 25, although if desired it may be peened over sufficiently to exert a constraining force against the outside surfaces of friction bearing means 28 as well.

It is seen that in the preferred embodiment of the swivel connector of this invention which has been described, the frictional resistance between the friction bearings opposing pivotal movement of mop handle 10 longitudinally or transversely with respect to mop body 11 will be maintained relatively constant regardless of the extent to which there is galling or other frictional wear between the moving surfaces. As the surfaces wear down, spring arms 18 and 19 and spring finger 21 of lower socket 16 all tend to move into the original positions to which they are biased. As this happens, the pressure at the points of frictional engagement tends to continue of substantially the same magnitude throughout the life of the swivel connector, and undesirable loosening of the connector parts is avoided even though the connector parts may wear with use.

The above detailed description of this invention has been given for ease of understanding only. No unnecessary limitations should be understood therefrom, as modifications will be obvious to those skilled in the art.

We claim:

1. A universal swivel connector for attaching a handle to a pivot member which comprises: a U-shaped lower socket member having a looped end portion receiving said pivot member, two upwardly extending friction bearing arms and a spring clamping finger integral with and extending from one of said arms in opposed spaced relation to said looped end portion, said finger being normally biased to press against said pivot member; an upper socket having an end portion adapted to receive a handle and having downwardly extending friction bearing means; and means for securing the friction bearing

5

means of the upper socket in rotatable, frictional engagement with said friction bearing means of the lower socket member, the spring clamping finger being urged against and in rotatable frictional resilient engagement with said pivot member.

2. A universal swivel connector for attaching a handle to a body which comprises: a pivot member secured to said body; a lower socket member having a looped end portion receiving said pivot member and having a pair of upwardly extending spaced apart arms formed of spring material, said arms being normally biased outwardly away from each other, said lower socket member also having a spring clamping finger integral with and extending from one of said arms in opposed spaced relation to said looped end portion, said finger being normally biased to press against said pivot member; an upper socket having an end portion adapted to receive a handle and having a pair of downwardly extending arms receiving said outwardly biased arms of said lower socket member, the arms of said upper socket being shaped to conform to and frictionally engage the arms of the lower socket member for at least a portion of the area thereof, with the spring clamping finger being urged against and in rotatable, frictional, resilient engagement with said pivot member; and means for maintaining the engaged arms of said upper and lower socket members in alignment with each other.

3. A universal swivel connector for attaching a handle to a body which comprises: a pivot member secured to said body; a lower socket member having a looped end portion receiving said pivot member and having a pair of upwardly extending spaced apart arms formed of spring material, said arms being normally biased out-

6

wardly away from each other, the upper ends of said arms having a dish shape, said lower socket member also having a spring clamping finger integral with and extending from one of said arms in opposed spaced relation to said looped end portion, said finger being normally biased to press against said pivot member; an upper socket having an end portion adapted to receive a handle and having a pair of downwardly extending arms receiving said outwardly biased arms of said lower socket member, the arms of said upper socket being shaped to conform to and frictionally engage the dish arms of the lower socket member for at least a portion of the periphery thereof, with the spring clamping finger being urged against and in rotatable, frictional, resilient engagement with said pivot member; and means for maintaining the dish arms of said upper and lower socket members in alignment with each other.

References Cited in the file of this patent

UNITED STATES PATENTS

1,281,883	Toof	Oct. 15, 1918
1,453,745	Cabana	May 1, 1923
1,735,278	Hertzberg	Nov. 12, 1929
1,997,685	Hertzberg	Apr. 16, 1935
1,998,634	Oberti	Apr. 23, 1935
2,050,762	Preisser et al.	Aug. 11, 1936
2,164,398	Glover	July 4, 1939
2,495,209	Chilo	Jan. 24, 1950

OTHER REFERENCES

Every-Which-Way Mops, W-1 price list, O-Cedar Corp., April 1955.