June 4, 1963 S. T. SHEARS 3,091,788

COMBINATION BRUSH AND WIPER

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Fig. 1.

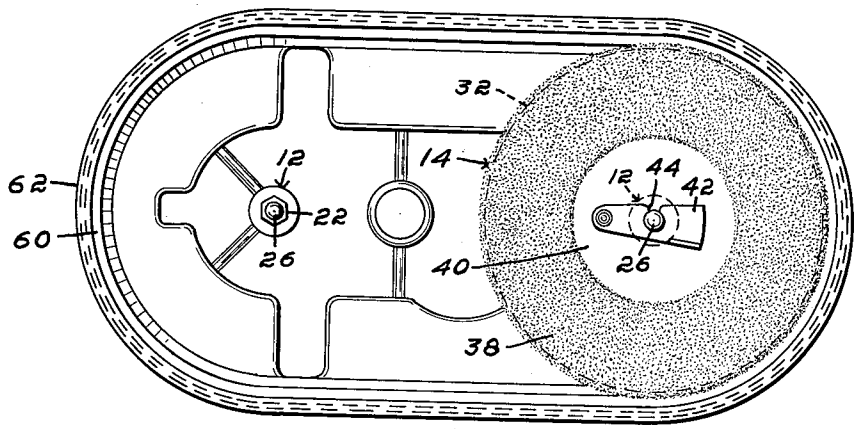


Fig. 2.

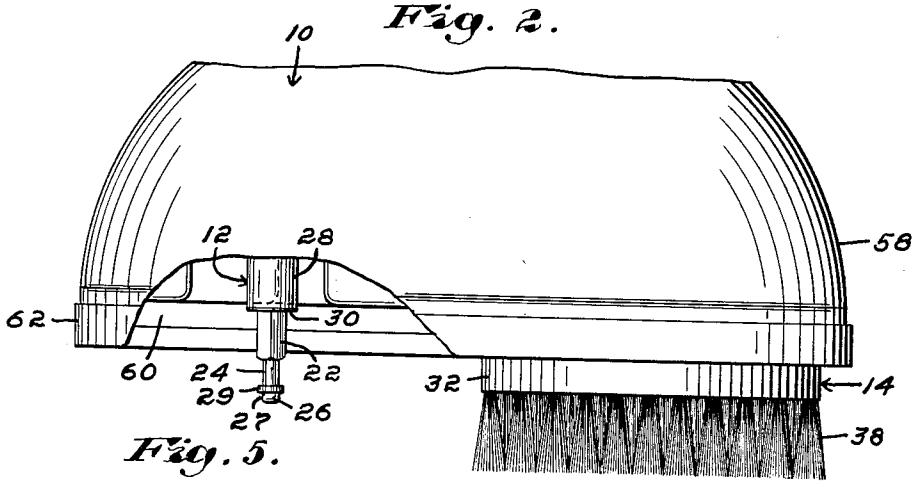


Fig. 5.

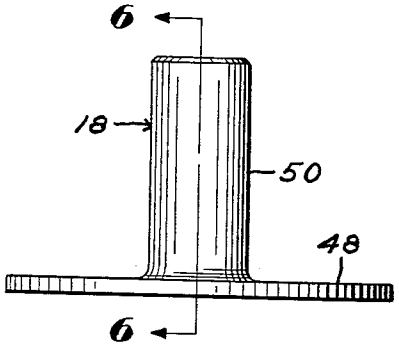
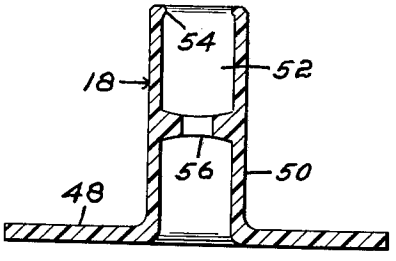


Fig. 6.



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Fig. 3.

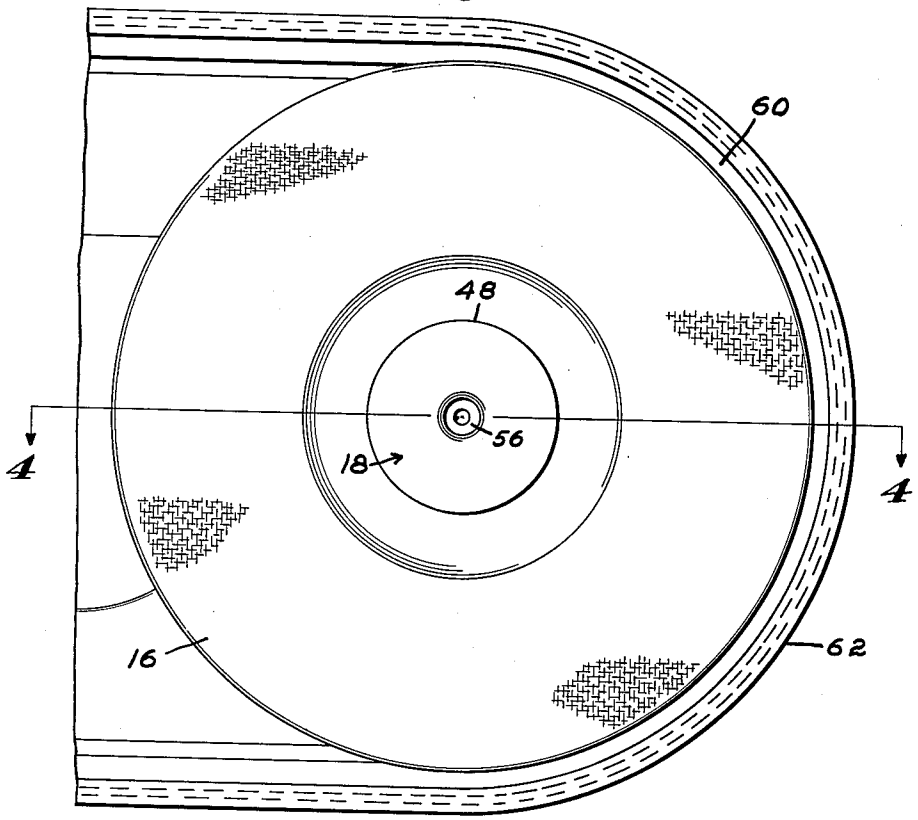
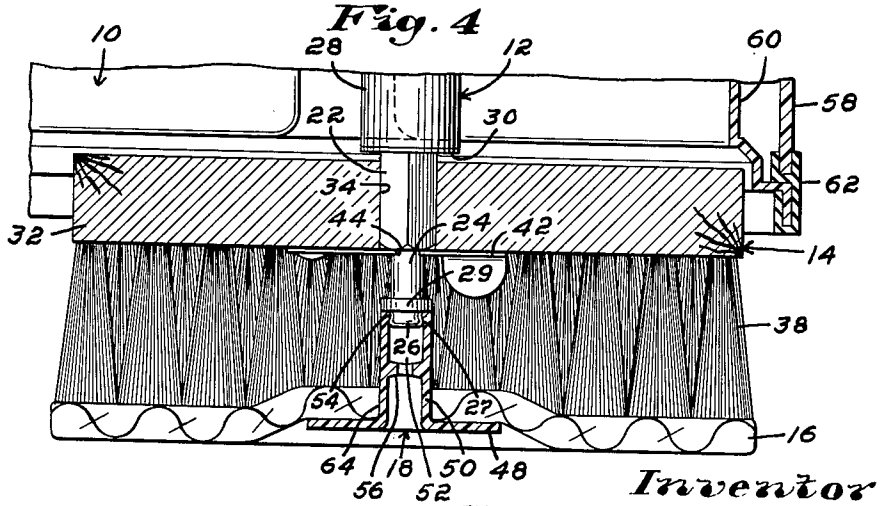


Fig. 4



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3,091,788
COMBINATION BRUSH AND WIPER

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This invention relates to the assembly of a drive shaft having an integral stud element, a brush, a cleaning pad and a separable fastening means.

An object of the invention is to provide the assembly of a drive shaft having an integral stud element, a brush, cleaning pad and a snap fastener having a comparatively long shank portion and comparatively broad flange portion.

A further object of the invention is to provide the assembly of a drive shaft having an integral stud element, a brush, cleaning pad and a fastener means capable of engagement to a drive shaft of a rotating element which will allow the element to rotate in either direction.

A still further object of the invention is to provide the assembly of a drive shaft having an integral stud element, a brush, cleaning pad and a fastener means for engagement with a rotating element which will not mar surfaces on which the rotating element is used.

Other objects of the invention will, in part, be obvious, and will, in part, appear hereinafter.

In the drawings:

FIG. 1 is a bottom plan view of a floor polishing machine showing one side with scrub brush attached and the other side without scrub brush attached;

FIG. 2 is a side elevation of a portion of the machine shown in FIG. 1 with part of the side without the scrub brush and being broken away;

FIG. 3 is a bottom plan view of the machine shown in FIG. 1 with one side broken away showing a pad and fastener assembled onto the scrub brush;

FIG. 4 is a section taken on the line 4—4 of FIG. 3;

FIG. 5 is a side elevation of the fastener; and

FIG. 6 is a section taken on line 6—6 of FIG. 5.

Referring to the drawings, FIGS. 1 and 2, there is shown the working elements of a rotating floor polisher comprising a housing **10**, a drive shaft **12** and a scrub brush **14**.

The applicant has not shown the gear train, the motor or handle elements of the floor polisher since the invention is not concerned with the controls or drive mechanism of which there are numerous types old in the art which may be utilized.

There are four major problems confronting the manufacturers of floor polishers in producing a versatile machine which is not too complicated for use by the average housewife. The first of these problems is to provide a series of brushes and pads capable of doing different types of cleaning which can be easily attached and removed from the machine. An old method of accomplishing this is to provide a screw or bolt element on the drive shaft which engages with an internally threaded nut or washer to retain the brush or pad. This type of fastening leads to the next two problems, that is, to provide a fastener which will allow rotation in both a clockwise and counterclockwise direction and to provide a fastener that will not mar the surface to be cleaned. In the screw type of fastener, the brush or pad can only be rotated in the one direction allowed by the threads and because of the required shape of almost all nuts, which can be conveniently applied, the brush or pad must be engaged well below the working surface to prevent marring.

Another method of fastening is that of a cleat which

longitudinally engages the shaft. This type can be made to avoid the necessity of turning a nut off and on, and will, if properly constructed, allow rotation in two directions, however, in order to avoid marring, the cleat must engage the shaft below the cleaning surface and this fact makes it difficult to easily remove the cleaning elements.

The applicant's device has none of the disadvantages mentioned and since it may be made of plastic materials, there is no danger of damage to the fastener by friction, heat, grease or a wide range of water temperatures. There is the additional advantage in applicant's device in that the scrub brush need not be removed to use the cleaning pad.

Referring now to FIGS. 3 and 4, beside the elements heretofore mentioned, there is shown a pad **16** which may be of any material necessary to accomplish the required work, such as steel wool and a fastener **18**.

The driveshaft **12** comprises a bearing portion (not shown), a polygonal portion **22**, a rod portion **24** and a stud portion **26**. A gear train (not shown) is engaged to said drive shaft **12** through said bearing portion **22** and to a motor engaged at the opposite end of said gear train. A bearing **28** circumscribes the bearing portion **20** preventing the shaft from striking the sides or walls between which it is passed. The said polygonal portion **22** is in the form of a cylindrical octagon although other geometric forms such as a hexagon may be used.

The said polygonal portion **22** engages said scrub brush **14** in a manner to be described hereinafter. The said rod portion **24** is cylindrical in form and connects said polygonal portion **22** with said stud portion **26** as shown in FIG. 2. The diameter of said polygonal portion **22** is smaller than the diameter of said bearing **28** creating a shoulder portion **30** on the terminal end of said polygonal portion **22** closest to said bearing **28**. The said stud portion **26** comprises a stud having an external peripheral shoulder **27** and a radially extending flange **29** as shown in FIG. 2. Naturally, the stud portion **26** may be formed in any necessary way to make proper engagement with the corresponding type of socket portion **52** that may be used.

The said scrub brush **14** comprises a wooden base portion **32** having an inner wall **34** defining an aperture, having a configuration corresponding to the form of said polygonal portion **22**, a series of bristles **38** extending from one side of said base portion **32** and defining a central opening **40** and a locking cleat **42** moveably connected at one of its terminal ends to said base portion **32** and having an engaging wall **44** defining an arcuate notch approximately midway between its point of connection and its opposite terminal end. The said engaging wall **44** lies on a plane in spaced superimposed position to the area formed between said inner wall **34**.

The said fastener **18** comprises a circular flange portion **48** having a tubular upstanding shank portion **50** axially formed in integral axial relationship thereto. Said tubular shank portion **50** is open at both its terminal ends and has a socket portion **52** integrally formed at the terminal end of said shank portion **50** farthest from said flange portion **48** as shown in FIG. 6. An arcuate bead **54** is formed adjacent the open terminal end of said flange portion **48** extending into the area circumscribed by said socket portion **52**.

As shown in FIG. 6, said socket portion **52** is a continuation of said shank portion **50** and the areas circumscribed by said socket portion **52** and by said shank portion **50** are separated by an apertured bridging element **56** which assists in stiffening said socket portion **52** and said shank portion **50**.

The housing **10** comprises an outer shell **58**, an inner shell **60** and a sealing gasket **62**. The outer shell **58** is

similar in configuration to the inner shell **60**, however, it has a greater diameter than said inner shell **60** and in assembly circumscribes in spaced relation the major portion of said inner shell **60**. The outer shell **58** has a generally cup shaped form with an aperture formed on its arcuate portion and with a circumferential free peripheral edge. The free peripheral edge of the outer shell **58** and of the inner shell **60** are joined by said sealing gasket **62** as shown in FIG. 4. The housing **10** serves both for its aesthetic value and for its prevention of dust and other such materials from reaching the drive mechanism.

To engage the drive shaft **12** with said scrub brush **14**, said fastener **18** and said pad **16**, the driveshaft **12** is passed between said inner wall **34** of said base portion **32** until the opposite side of said base portion **32** from the side on which the bristles are located abuts or comes into close proximity to a portion of said bearing **28**, and said shoulder portion **30**. The length of said polygonal portion **22** of said driveshaft **12** is approximately equal to the thickness of said base **32**. The locking cleat **42** can now be swiveled, whereby its engaging wall **44** will circumscribe a portion of said rod portion **24** sandwiching and locking said base portion **32** between said locking cleat **42** and said shoulder portion **30**. The said pad **16** can now be placed in superposed, a butting relationship with said bristles **38** of said scrub brush **14**. The pad **16** has a shank engaging wall **64** defining an axial aparture and the socket portion **52** and the shank portion **50** of the fastener **18** are passed between the shank engaging wall **64** and said socket portion **52** is engaged to the stud portion **26** of said drive shaft **12** whereby the bead **54** is snapped around the neck of the stud portion **26** behind the external peripheral shoulder **27** in a manner old in the fastener art. Both said socket portion **52** and said shank portion **50** together have a length slightly less than the distance from the end of the stud portion **26** to the outermost face of the pad **16** so that when the fastener **18** is engaged to the stud portion **26**, as described hereinbefore, the flange portion **48** of the fastener **18** depresses part of the pad **16**, whereby the flange **48** lies on a plane spaced below the outer surface of the pad **16** as shown in FIG. 4.

Since certain other obvious modifications may be made in this device without departing from the scope of the invention as set forth in the claims, it is intended that all matter contained herein be interpreted in an illustrative and not in a limiting sense.

I claim:

1. The combination of a separable fastener, a drive shaft having a rod portion at its extremity, a brush having bristles, and a cleaning pad, said brush having means for engaging said rod portion and said fastener including two elements, said two elements comprising a stud element formed on the end of said drive shaft and a socket element formed from a single piece of plastic material, said socket element comprising a tubular shank portion extending from a flange portion, said flange portion having a diameter greater than said shank portion, and said shank portion and said rod portion together having a length slightly greater than the height of said bristles, said socket element separably engaging said stud element and said flange portion engaging the underside of said cleaning pad whereby said cleaning pad is placed in abutting relation with said bristles.

2. The combination of a separable fastener, a drive shaft having a rod portion at its extremity, a brush having bristles and a cleaning pad, said brush having means for engaging said drive shaft, and said fastener including two elements, said two elements comprising a fastener element formed on the end of said rod portion and a complementary fastener element, said complementary fastener element comprising a tubular shank portion extending from a flange portion, said flange portion having a diameter greater than said shank portion, and said shank portion and said rod portion together having a length slightly greater than the height of said bristles, said complementary fastener element separably engaging said fastener element and said flange portion engaging the underside of said cleaning pad whereby said cleaning pad is placed in abutting relation with said bristles.

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