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3,481,017

CORE STRUCTURES FOR ROTARY BRUSHES

Filed March 9, 1967

2 Sheets-Sheet 1

Fig. 1

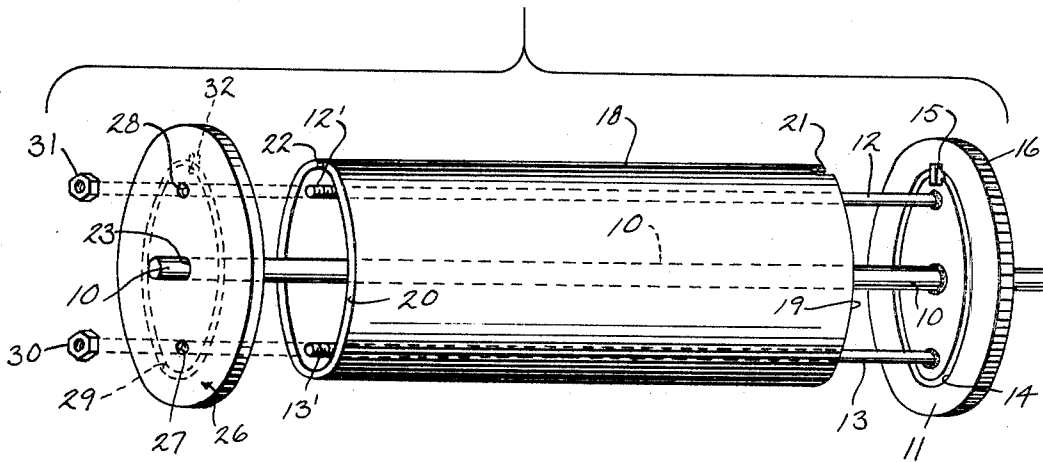


Fig. 2

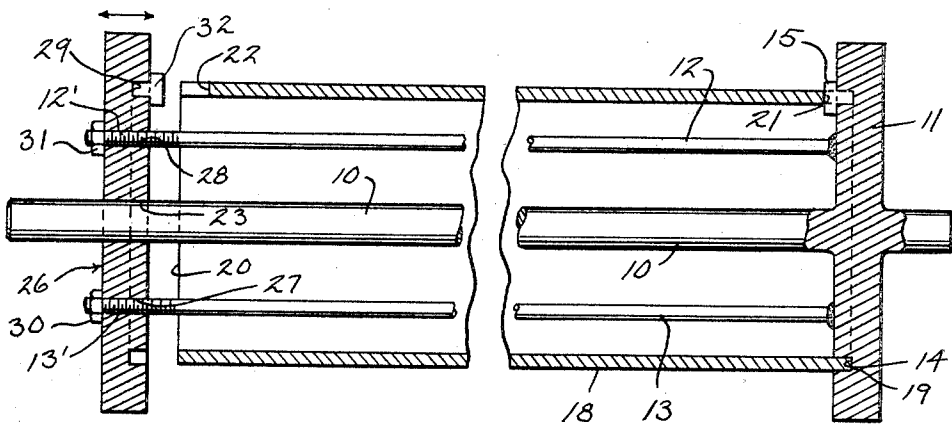
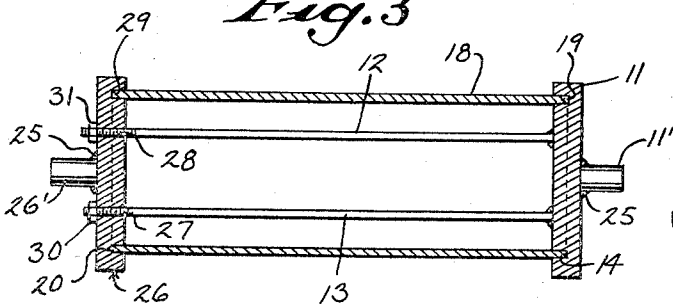


Fig. 3



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Fig. 4

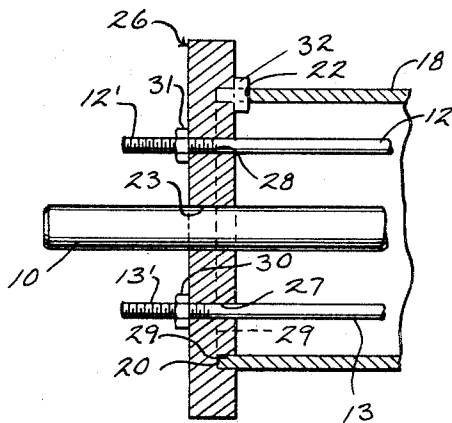


Fig. 5

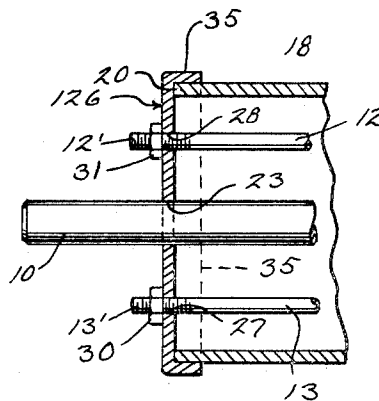


Fig. 6

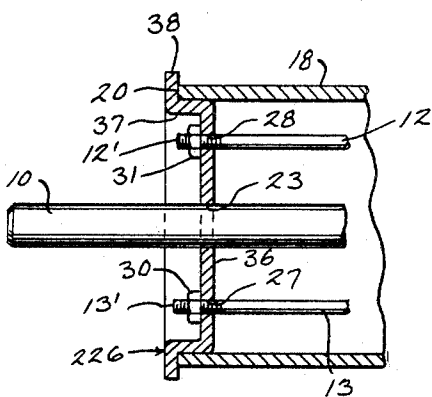
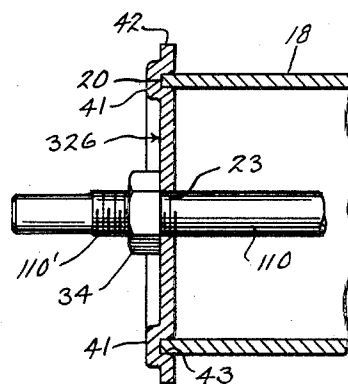


Fig. 7



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CORE STRUCTURES FOR ROTARY BRUSHES
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1 Claim

ABSTRACT OF THE DISCLOSURE

To form an inexpensive and easily assembled core for power-driven cylindrical brushes there is provided a hollow cylinder clampingly retained by and between a pair of end plates which are adjustably interconnected by elongated rods extending longitudinally within said cylinder, said end plates having means on their inner faces for positioning and retaining said cylinder concentric with the longitudinal axis of said unit.

BACKGROUND OF THE INVENTION

Field of the invention

The present invention pertains to the construction of cylindrical brushes, and more particularly to cores for power-driven rotary brushes of the type utilized in street or floor-cleaning machines and the like.

Description of the prior art

In the construction of power-driven rotary brushes of the type herein concerned the projecting bristles or brush filaments are ordinarily mounted on and around a hollow cylindrical body or core which is supported by a plurality of welded or cast struts and specially-machined supporting members within said cylinder. Such conventional core structures are relatively expensive and add substantially to the manufacturing cost of the brush.

SUMMARY OF THE INVENTION

The present invention provides a simplified core design for power-driven rotary brushes which comprises a pair of end plates provided with elongated connecting rods and nuts which permit said plates to clampingly retain a cylindrical core shell therebetween, said plates having annular grooves or equivalent means on their inner faces to engage and position the cylinder ends to ensure said cylinder is properly positioned. Said simplified structure is substantially less expensive than conventional cylindrical brush cores of the type including multiple machined and welded or cast struts and supports, and can also be assembled faster and more easily than said prior cores, thereby further reducing manufacturing costs.

Further advantages of the new core structure are that it is lighter in weight than conventional cylindrical brush cores, it is strong and durable, it is reliable in operation, and it is otherwise particularly well suited for its intended purposes.

BRIEF DESCRIPTION OF THE DRAWINGS

In the drawings, wherein there is shown one embodiment of the invention and several modifications thereof, and wherein the same reference numerals designate the same or similar parts in all of the views:

FIG. 1 is an exploded perspective view of one form of core structure coming within the scope of the invention;

FIG. 2 is a longitudinal sectional view through said core;

FIG. 3 is a longitudinal sectional view through a modified core structure wherein the axle has been eliminated;

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FIG. 4 is a fragmentary longitudinal sectional view showing an end of the core illustrated in FIGS. 1 and 2 in its assembled condition;

FIG. 5 is a fragmentary sectional view showing an end of a modified form of the invention;

FIG. 6 is a fragmentary view of another modified form; and

FIG. 7 is a fragmentary sectional view of still another modified form of the present invention.

DESCRIPTION OF THE PREFERRED EMBODIMENTS

Referring now more particularly to FIGS. 1 and 2 of the drawing, the illustrated form of the invention includes a first end plate 11 welded or otherwise rigidly mounted on and adjacent one end of an axle 10, said axle being of any desired length depending upon the intended use of the brush. Said end plate 11 may be provided with peripheral sprocket teeth 16 to permit the direct attachment thereto of a chain or similar drive assembly associated with a prime mover, although the invention is not to be limited in this respect. The inner face of said end plate is provided with an annular groove 14 which is concentric with but of substantially larger diameter than the axle 10, and projecting from said face in alignment with said groove in the illustrated form of the invention is a key or lug 15, the function of which will be hereinafter seen.

Projecting laterally from the inner face of the end plate 11 is a pair of elongated rods 12, 13 which extend in parallel relationship to the axle 10, substantially the entire length of said axle, and the outer projecting ends of said rods are threaded as at 12', 13' to receive nuts 30, 31. Surrounding said rods 12, 13 and axle 10 is a hollow tube or cylinder 18 formed of steel or any other suitable material, and formed at the end 19 thereof adjacent the end plate 11 is a cutout 21 which is designed to closely accommodate the lug 15 projecting from the inner face of the end plate 11 in the illustrated structure.

Carried adjacent the opposite end of the axle 10 is a second end plate 26 which is removably mounted on said axle, there being a center hole 23 through which said axle projects. Said end plate 26 is provided with a pair of apertures or holes 27, 28 through which the ends of the rods 13, 12 may be projected, and formed on the inner face of said second end plate is an annular groove 29 and, if desired, an inwardly projecting lug 32 (FIG. 2) adapted to be fitted in a cutout 22 in the cylinder end 20.

As best appears in FIGS. 2 and 4, to assemble the illustrated cylindrical brush core structure the cylinder 18 is first mounted on and surrounding the axle 10 and rods, 12, 13, and is positioned with its end 19 abutting the rigid end plate 11. Said cylinder is of the same diameter as the end plate annular grooves 14, 29, and the cylinder end 19 is urged into said groove 14 to maintain said cylinder concentric with the axle. Simultaneously said cylinder is indexed to bring the cutout 21 therein into registration with the projecting lug 15 on the end plate.

The second end plate 26 may then be mounted on the axle and manually moved toward the opposite end 20 of the cylinder. The ends of the rods 12, 13 are projected through the holes 28, 27 in said end plate, and said end 20 of the cylinder is inserted into the annular groove 29 in said plate, with the lug 32 on said plate projecting into the cylinder cutout 22. Nuts 30, 31 are then threaded onto the projecting ends of the rods 13, 12 and tightened against the face of the end plate 26 to clampingly secure the cylinder between said plates 11 and 26. As hereinabove described, due to the annular grooves in said end plates within which the cylinder ends fit, said cylinder is retained concentric to the axle 10. While a pair of plate-connecting rods 12, 13 have been illustrated and

described herein, a single rod could be employed for the same purpose, or more than two of said rods could be used, and the invention is not to be limited in this respect.

When the core has been assembled, as described, the bristles or brush filaments (not shown) may be mounted on and around the peripheral surface of the cylinder 18, and the brush installed in the equipment or machine for which it was intended. As mentioned, the end plate 11 is preferably in the form of a sprocket so that a chain drive or the like can be connected directly thereto, and during the rotation of said end plate the engagement of the lug 15 within the cylinder cutout 21, and the corresponding engagement of the lug 32 on the end plate 26 within the cylinder cutout 22, rotatably drivably joins said members so they rotate as an integral unit.

In FIG. 3 of the drawings there is illustrated a modified core structure wherein the elongated axle 10 utilized in the form of the invention shown in FIGS. 1 and 2 has been eliminated. This simplified and lightweight design is preferred for some brush machines, and, as will be seen, the end plate 11 has a short axle stub 11' welded or otherwise rigidly secured thereto and projecting outwardly therefrom, and the opposite end plate 26 has a similar projecting stub 26'. Said end plates are adjustably interconnected by elongated rods 12, 13, and nuts 30, 31, the plate 26 being provided with openings 28, 27 through which the ends of said rods project, and annular grooves 14 and 29 are formed in said plates to accommodate the ends of the cylinder 18 to retain said cylinder concentric with the longitudinal axis of the unit, as in the form of the invention hereinabove described.

It will be noted that in FIG. 3 the driving lugs on the end plates and corresponding cylinder cutouts shown in FIGS. 1 and 2 have also been eliminated. It has been found that for many installations the frictional force fit of the cylinder ends within the end plate annular grooves 14 and 29 is sufficient to prevent relative slipping of said members, thereby drivably connecting the same and making said lugs and cylinder cutouts unnecessary. This is not only true of the core structure shown in FIG. 3, but also of all the other embodiments of the invention illustrated and described herein, and the invention is not therefore to be limited to core structures including said driving lugs.

Referring now more particularly to FIG. 5 of the drawings, illustrated therein is another modified form of the invention wherein the end plate 126 is provided with an inwardly-flanged peripheral rim 35 which is designed to closely surround the cylinder 18 when the latter is in its assembled position, there being a similar plate at the opposite end of the cylinder. Said intumed flange design eliminates the necessity for the formation of annular grooves in said end plates in order to maintain the cylinder concentric with the axle, and is an economical design. The elongated plate-connecting rods 12, 13 and nuts 31, 30 function in the manner hereinabove described, and driving lugs or keys may be provided if desired.

Another modified end plate design is shown in FIG. 6 of the drawings, and in this form of the invention the plate 226 is flanged transversely as at 37, and then radially outwardly at a right angle, as at 38, thus providing an annular shoulder over which the cylinder 18 fits when the unit is assembled. A similarly-formed plate can be utilized at the opposite end of the cylinder to ensure the concentric positioning of said cylinder. As hereinabove described, the illustrated elongated axle 10 could be replaced by short axle stubs welded onto said end plates, and driving keys or lugs can be provided on the

plate inner faces and positioned to project into cutouts in the cylinder ends to positively rotatably drivably connect said cylinder and end plate members.

Still another modification of the invention is illustrated in FIG. 7 of the drawings. In this form the elongated plate-connecting rods featured in the above described embodiments of the invention are eliminated, and the axle 110 is threaded, as at 110'. An enlarged nut 34 is threaded onto the end of said axle to clampingly retain the cylinder 18 between the plate 326 and a similar plate at the opposite end of said cylinder. In this simplified form of the invention the plate 326 is flanged to form an annular groove 43 for the end of the cylinder, thereby positioning and retaining said cylinder concentric with the axle.

From the foregoing detailed description it will be seen that the present invention provides several varied forms of a novel core structure for rotary brushes. The principal advantage of said new core designs is that they eliminate the necessity for a plurality of relatively expensive, specially-machined cast or welded supporting members within the cylinder, as is required in conventional cylindrical brush cores. In addition, said new core structure is also easier to assemble and is lighter in weight than said conventional cores.

What I claim is:

1. A core assembly for a rotary, power-driven cylindrical brush, comprising: a first circular end plate having an inner face with a lug projecting transversely therefrom and having peripheral sprocket teeth adapted to mesh with an endless drive chain trained therearound and operatively associated with a prime mover; elongated plate-connecting rods projecting transversely from the inner face of said end plate, the free ends of said rods being threaded; a hollow cylinder surrounding said elongated connecting rods and having one of its ends abutting the inner face of said end plate, said end plate being of substantially larger diameter than said cylinder, and the cylinder being shorter in length than said connecting rods and having cutouts formed in its ends, said end plate lug projecting into the cutout in the abutting end of said cylinder to form a rotary drive connection; a second end plate having an inner face abutting against the opposite end of said cylinder, said plate having openings through which said connecting rods project, and said second end plate having a lug on its inner face projecting into the abutting cylinder end cutout to form a rotary drive connection; nuts threaded onto the projecting ends of said connecting rods to clampingly retain said cylinder between said end plate; and means associated with said end plates and cylinder positioning and retaining said cylinder concentric with the longitudinal axis of said unit.

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U.S. Cl. X.R.

15—179; 29—125