Sept. 4, 1928. 1,683,167

S. CUNNINGHAM

EXPANDING MANDREL

Filed Aug. 30, 1926

Fig. 1.

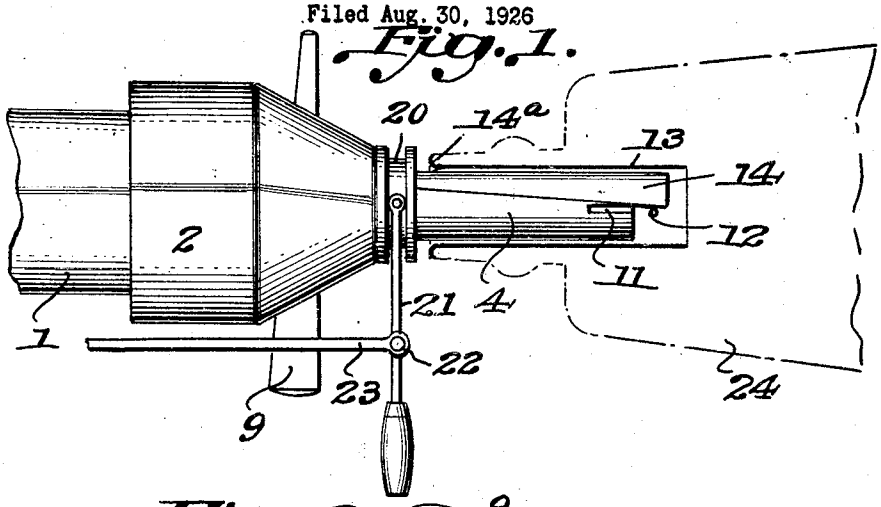


Fig. 2.

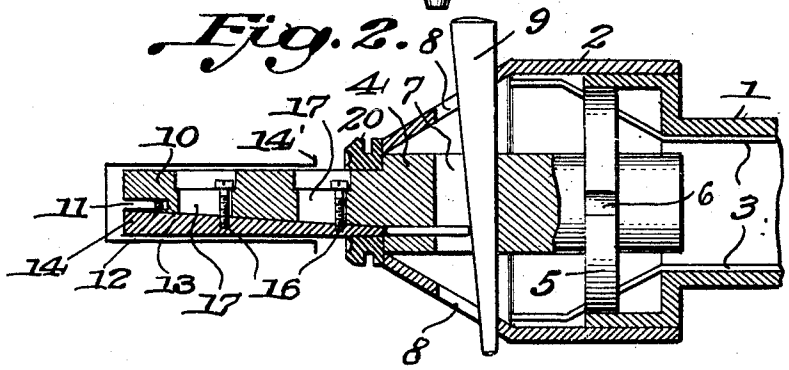
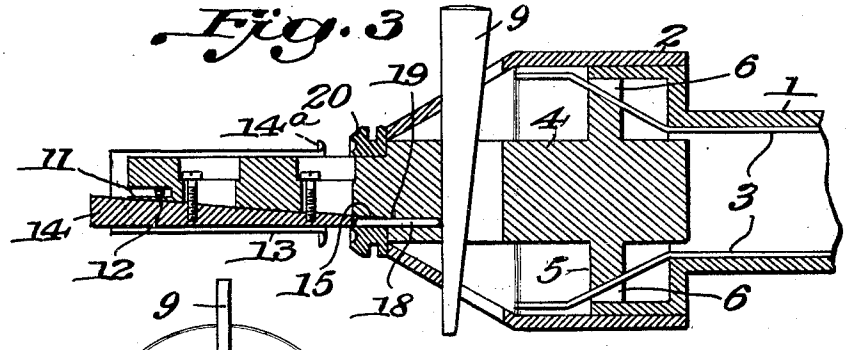


Fig. 3



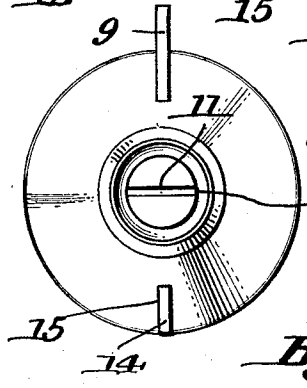


Fig. 4

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UNITED STATES PATENT OFFICE.

SYLVESTER CUNNINGHAM, OF EVANSVILLE, INDIANA.

EXPANDING MANDREL.

Application filed August 30, 1926. Serial No. 132,625.

This invention relates to an expanding mandrel for holding the tube or shell on which a handleless broom is to be made.

My improvements may be embodied in a wholly new chuck, or, they may be adapted to an ordinary chuck which is used for making brooms having handles, for the purpose of converting such ordinary chuck into an automatic chuck for the purpose set forth.

In converting an ordinary chuck into my improved automatic chuck or mandrel, the housing, the handle, and the grippers of the old chuck are removed and my improved expanding and contracting mandrel is substituted, means being provided for holding the springs formerly used for operating the grippers.

A practical embodiment of the invention is set forth hereinafter and is shown in the accompanying drawings in which:

Figure 1, is a side elevation, the tube or thimble being indicated in a diagrammatic manner and the broom which has been formed being shown in dot-and-dash lines;

Fig. 2, is a longitudinal section, the mandrel being expanded and the tube or thimble being shown in position thereon;

Fig. 3, is a similar view, the mandrel being contracted and the tube or thimble having been formed with the bead thereon; and

Fig. 4, is an end elevation.

The shaft of the chuck appears at 1 and the housing is shown at 2. The springs shown at 3 are those which, prior to the conversion of the device into an automatic mandrel according to my invention, were used to operate the grippers which were employed within the housing 2 for the purpose of gripping the handle of the broom.

These springs 3 are allowed to remain and are ordinarily used to hold the mandrel 4 of my invention, connecting it to the shaft 1. For that purpose, the mandrel 4 is provided with a head or disc 5 which has notches 6 that receive the springs 3, said disc 5 fitting within the end of the shaft 1.

The mandrel is provided with a transverse slot 7. Corresponding slots 8 are provided in the housing 2. The slots 7 and 8 accommodate a wedge 9 which, when in the position, shown in Figure 2, permits the expanding mandrel to expand, but when driven into the position shown in Figure 3, causes the mandrel to contract.

The mandrel has a fixed part 10 provided with a transverse slot 11 to accommodate the pin 12 which is carried by the tube or thimble 13, such being the usual construction of tubes or thimbles used in the manufacture of handleless brooms. As originally formed, the tube 13 has a flange 14′. Such flange is beaded or crimped into the form shown at 14^a in Figures 1 and 3, as will presently appear.

The expanding section of the mandrel is shown at 14, being a piece which is mounted to slide longitudinally in a channel or groove 15, in the mandrel and guided by screws 16 which work in slots 17. The expanding section 14 is operated by a slide 18 which works in an opening 19 in the mandrel 4 and bears on the end of the section 14 and also on the wedge 9.

When the section 14 is driven home as shown in Figure 2, to hold the tube 13, the wedge 9 is in the position shown in Figure 2. When the broom has been formed and it is desired to release it from the mandrel, the wedge 9 is driven in, thereby contracting the section 14 as shown in Figure 3.

Slidably mounted on the mandrel 4 is a beading or crimping collar 20 which is adapted to change the form of the flange 14′, Fig. 2, to the form shown at 14^a, Figs. 1 and 3. The collar 20 is operated by a handle 21 pivoted at 22 to a member 23 which is fixed to the frame of the machine.

The tube or thimble 13 having been slipped over the mandrel 4, the section 14 is forced inwardly to clamp the tube on the mandrel. The pin 12 which is carried by the tube, enters the slot 11. When the broom is fully wrapped by the wire employed for that purpose, the tube 13 is tight on the mandrel and would tend to stick were it not for the provision of the section 14 and the wedge 9. To release the finished broom, it is only necessary to tap on the wedge 9 to force the section 14 to the position shown in Fig. 3, thereby releasing the broom so that it may be taken off of the mandrel.

By operating the handle 21, the bead 14^a may be formed on the end of the broom, the latter appearing at 24.

My invention can be made without employing any parts of the old handle or holding chuck but it has great usefulness in being constructed so that it may be adapted to the old style of chuck by utilizing the shaft 1, housing 2, and springs 3 of said old chuck

and by removing the grippers which, prior to my invention, were used to grip the handle of the broom entered in the chuck.

My invention provides a means by which handleless brooms may be quickly and easily made on present-day broom making machines.

What I claim, is:

1. In an expanding mandrel of the character set forth, the combination with a shaft and a housing carried thereby, of a mandrel having a part thereof received within the housing and provided with a head, members carried by the shaft which project into the housing and positively locked with the head aforesaid for the purpose of driving the mandrel from the aforesaid shaft, said mandrel having an expanding part extending outside the housing, and means carried by the housing and independent of the aforesaid securing means for operating the expanding part of the mandrel.

2. In an expanding mandrel of the character set forth, the combination with a shaft and a housing, of an expansible mandrel whose body is received within the housing and is provided with a cross-slot, said mandrel being provided with an exteriorly arranged wedge which is slidable lengthwise of the mandrel and adapted to directly engage the article to be held, and a key which is slidable through the housing and through the slot in the body of the mandrel, said key being adapted to co-operate with the slidable wedge of the mandrel.

In testimony whereof I affix my signature.

SYLVESTER CUNNINGHAM.