E. J. FEENY.

AIR TIGHT CLOSURE AND CLAMP THEREFOR.

APPLICATION FILED MAR. 11, 1912.

1,089,754. Patented Mar. 10, 1914.

Fig. 1.

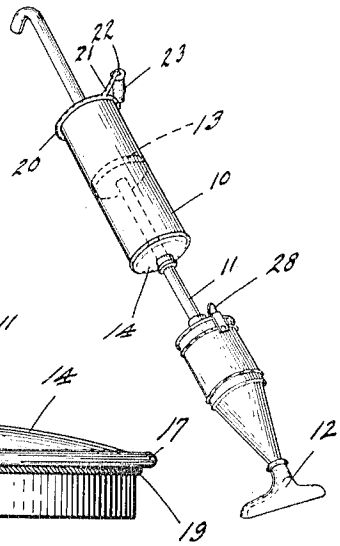


Fig. 6.

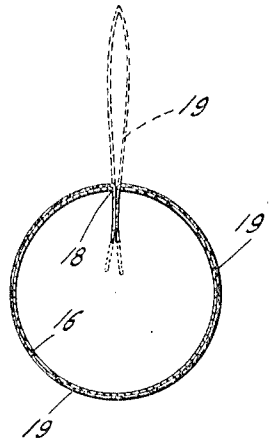


Fig. 5.

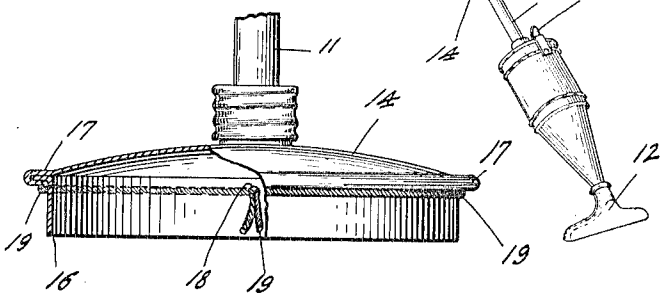


Fig. 3.

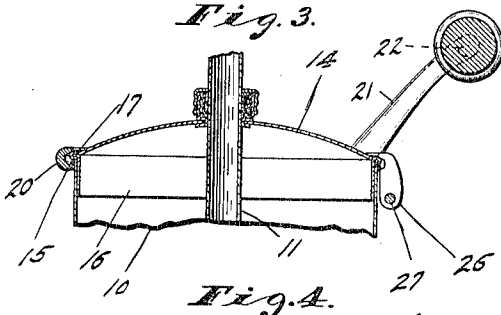


Fig. 2.

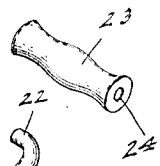
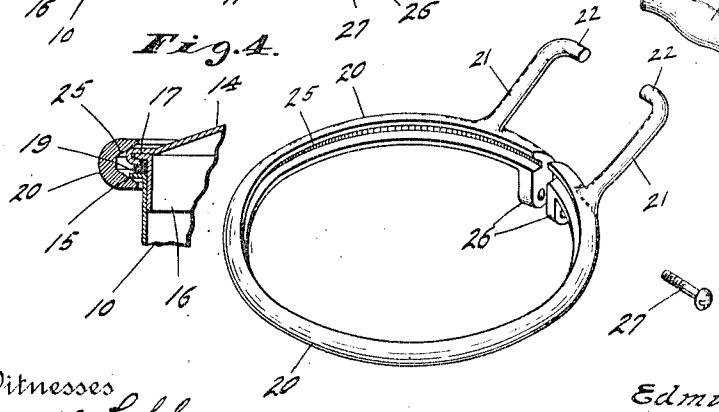


Fig. 4.



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UNITED STATES PATENT OFFICE.

EDMUND J. FEENY, OF MUNCIE, INDIANA, ASSIGNOR TO THE FEENY MANUFACTURING COMPANY, OF MUNCIE, INDIANA, A CORPORATION OF INDIANA.

AIR-TIGHT CLOSURE AND CLAMP THEREFOR.

1,089,754. Specification of Letters Patent. Patented Mar. 10, 1914.

Application filed March 11, 1912. Serial No. 682,901.

To all whom it may concern:

Be it known that I, EDMUND J. FEENY, a citizen of the United States, residing at Muncie, in the county of Delaware and State of Indiana, have invented a new and useful Air-Tight Closure and Clamp Therefor, of which the following is a specification.

In the manufacture of a certain type of vacuum cleaning apparatus there is a suction nozzle which is adapted to be pushed over the surface to be cleaned and to this suction nozzle is connected a suction pipe which also forms a handle by means of which the suction nozzle is caused to traverse the floor. This suction pipe is provided at an intermediate point with a piston which fits within a cylinder which is sleeved over the suction pipe and a vacuum is created within the suction nozzle by relative reciprocation of the piston and cylinder, it being commonly the practice, in the use of such an apparatus, for the operator to hold the cylinder substantially stationary and to reciprocate the piston within the cylinder by shoving the suction nozzle back and forth across the floor. The commercial value of such an apparatus is not only dependent upon its efficiency as a dust-sucking apparatus but is also largely dependent upon the price at which it can be profitably marketed and delivered to the individual user. It is therefore essential that an apparatus of this type be produced at as small an expense as possible.

The object of my present invention therefore is to provide various details of construction which increase the efficiency of a device of the class described, at small cost. In such a device the cylinder must be provided with a handle member by means of which it may be readily grasped and reciprocated or held and the cylinder member must also be provided with a removable cap.

Specifically the object of my present invention is, therefore, to provide a simple and efficient construction by means of which the cylinder cap may be readily attached to and detached from the cylinder by means which will form an air-tight connection when the cap is in position upon the cylinder.

A further object of my invention is to provide the clamping member with a handle structure by means of which the cylinder of the apparatus may be manipulated.

It will of course be understood that the devices, which I shall describe, while especially designed for the particular apparatus set forth, are nevertheless useful for similar purposes in other apparatus.

The accompanying drawings illustrate my invention.

Figure 1 is a perspective view of the particular type of vacuum cleaning apparatus for which my present improvements were particularly designed; Fig. 2 a perspective view of the improved clamping and handle member with the several elements thereof separated; Fig. 3 an axial section of the assembled parts; Fig. 4 a fragmentary sectional detail in the same plane as that of Fig. 3; Fig. 5 a partial axial section of the cover member; and Fig. 6 a section just above the packing string.

In the drawings, 10 indicates a cylinder sleeved upon a hollow stem 11 which carries a suction nozzle structure 12. The stem 11 carries a piston 13 and is provided with valve mechanism by means of which reciprocation of the piston relative to the cylinder will cause air to be drawn inwardly through the nozzle 12. The details of this particular valve mechanism form no part of my present invention however, and therefore no attempt is made to illustrate them. The ends of the cylinder 10 are closed by caps 14 and the upper end of the nozzle structure 12 is also closed by a similar cap. Cylinder 10 and the caps are, for economy, made of sheet metal but it is essential that the joint between each cap and its main body or cylinder be tight against air, at least to the pressures which are obtainable with the apparatus, such pressures being of course somewhat less than, and never exceeding, atmospheric pressure.

In order to produce an air-tight joint by a simple and inexpensive construction I provide the open end of the cylinder with an outwardly flaring flange 15 and the cap 14 is provided, in a manner entirely familiar to sheet metal workers, with a cylindrical depending flange 16 which fits fairly within the open end of the cylinder but of course

not in an air-tight manner because to produce an air-tight joint would require expensive fitting operations. Flanking the cylindrical portion 16 of the cap is an outwardly flaring flange 17 which is formed by the interlocking parts of the main body of the cap and the depending flange 16 in a well known manner and this outwardly flaring flange 17 is adapted to rest upon, or rather to overlie, the flange 15.

Immediately beneath the flange 17 I form a small hole 18 through the flange 16. I then take a desirable length of rather large soft string 19, which is readily obtainable in the open market, and the uncompressed diameter of this string being such that two diameters laid side by side will be greater than the diameter of hole 18. The string 19 is then doubled, as indicated in Fig. 6, and the bight of the string is projected through hole 18 from the inside of flange 16 outwardly and thence drawn outwardly, stretching somewhat in the process, until a sufficient loop has been drawn out to permit the loop to be turned backwardly over the end of flange 16 and the loop slipped down over the flange 16 so as to lie within the crotch between said flange 16 and the flange 17, the ends of the string 19 remaining inside of the flange 16 where, if necessary, they may be pulled inwardly in order to tighten the packing, thus formed by the loop of the string 19, around the flange 16, the parts being held in place frictionally by the compression of the string passing through hole 18. In order to clamp the flange 17 down upon flange 15 and thus clamp the packing 19 in place, I provide a clamping ring 20 which is split at one point and carries handle arms 21, there being preferably two of these arms each carried by the split ring 20 near an end thereof. Each of these handle arms 21 is provided with a finger 22, the two fingers being projected toward each other and adapted to be projected into the perforations 24 formed in the ends of a hand piece 23. The interior of the clamping ring 20 is provided with a V-shaped groove 25 thereby forming an outwardly tapered pocket for the reception of the two flanges 15 and 17 so that, when the two ends of the clamping ring are drawn together, this V-shaped pocket will act upon the two flanges 15 and 17 to crowd them together and compress the packing 19. The two ends of the clamping ring 20 are provided with lugs 26 which are perforated to receive a clamping screw 27 which serves not only to clamp the ends of the ring together so as to clamp the ring upon the flanges 15 and 17, but also serves to hold the handle arms 21 in coöperative relation with the hand piece 23.

The construction of the several caps 14, together with the packing 19 associated therewith, may be the same as that described in connection with the clamping ring 17, and means other than the particular clamping ring described may be used for holding the cap in place. For instance, the lower cap 14, which is secured to the lower end of pipe 11, may be connected with the nozzle 12 by spring catch fingers 28.

I claim as my invention:

1. A combined clamping ring and handle comprising a split ring, a handle arm carried by each end of the ring, said handle arms each having a finger projected toward the finger of the other arm, a hand piece formed at its ends to interengage with the fingers of the handle arms, and a clamping member for clamping the ends of the ring together.

2. A combined clamping ring and handle comprising a split ring, and outwardly projecting arms carried by the adjacent ends of said split ring, the said arms carrying a cross member extending between the arms and forming a hand piece which may be grasped in the hand of an operator with the fingers lying between the outwardly projecting arms, and a clamping member for clamping the ends of the ring together independently of said arms.

3. A combined clamping ring and handle comprising a split ring, a handle arm carried by each end of the ring, a hand piece, the said hand piece and handle arms having interengaging portions, and a clamping member for clamping the ends of the ring together and simultaneously holding the hand piece in engagement with the handle arms.

4. The combination of a pair of members to be clamped together, said members provided with mating flanges, a split clamping ring internally formed to receive and clamp together the said flanges, a handle arm carried by each end of said split ring, and a clamping member for clamping the two ends of the ring together.

5. The combination of a pair of members to be clamped together, said members provided with mating flanges, a split clamping ring internally formed to receive and clamp together the said flanges, a handle arm carried by each end of said split ring, a hand piece, said hand piece and the two handle arms being formed for interengagement, and a clamping member for clamping the ends of the split rings together upon the flanges and for simultaneously holding the handle arms and hand piece in engagement.

6. In a vacuum cleaner, the combination of a cylinder having an outwardly flaring flange, a cap for said cylinder having a portion arranged to overlie the flange of the cylinder, a split clamping ring having an outwardly tapered pocket formed around its inner periphery, means for drawing the ends of the clamping ring together to crowd

said outwardly tapered pocket over the cylinder flange and overlying cap, a pair of handle arms carried by the adjacent ends of the clamping ring, and a hand piece having interengagement with the two handle arms and held in place by the means for drawing the ends of the clamping ring together.

In witness whereof, I, have hereunto set my hand and seal at Muncie, Indiana, this 4th day of March, A. D. one thousand nine hundred and twelve.

EDMUND J. FEENY. [L. S.]

Witnesses:
L. L. BRACKEN,
ERLE G. MEEKS.