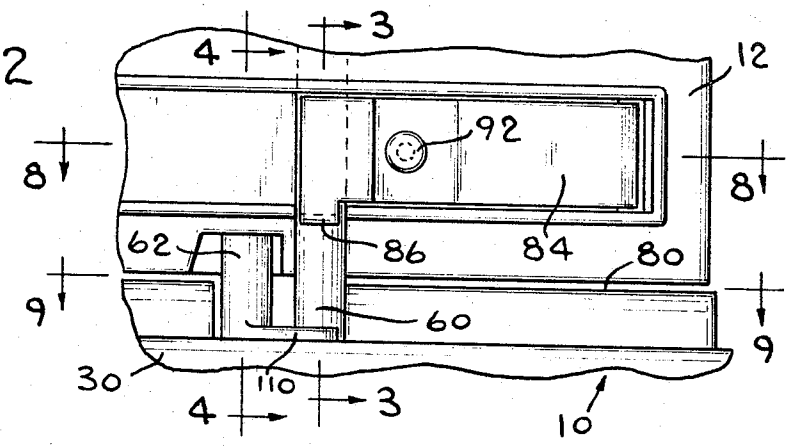
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CARPET SHAMPOOER

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FIG. 2



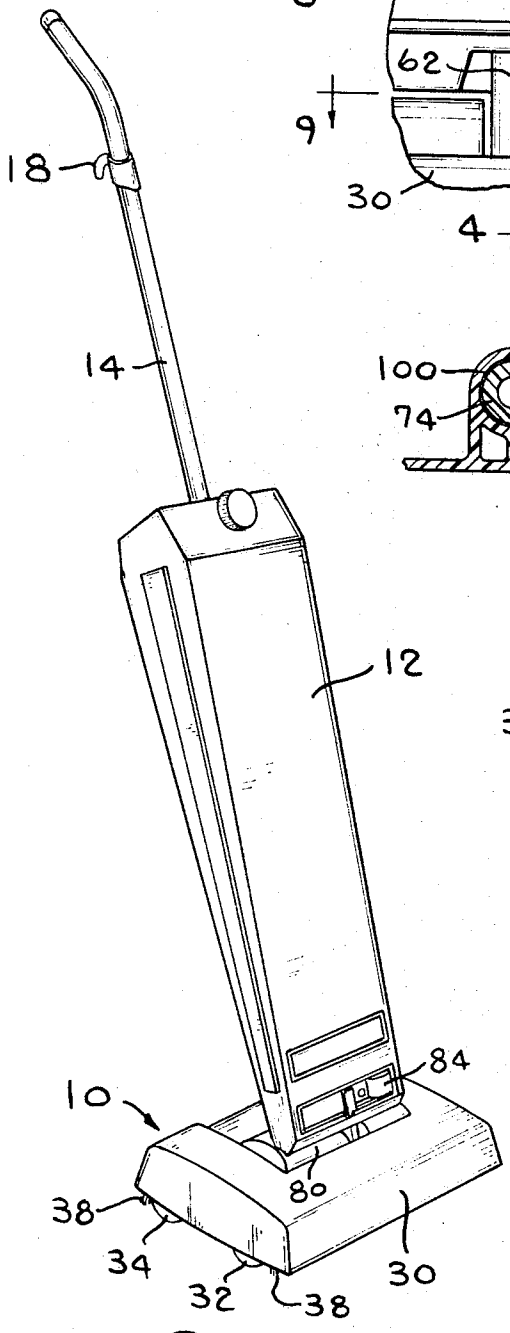


FIG. 1

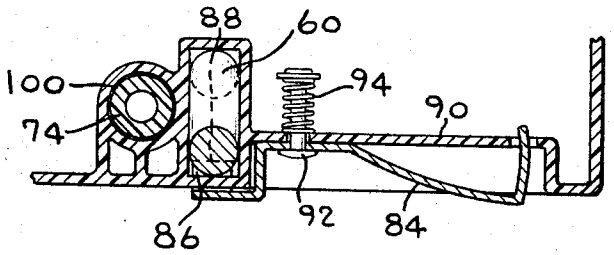
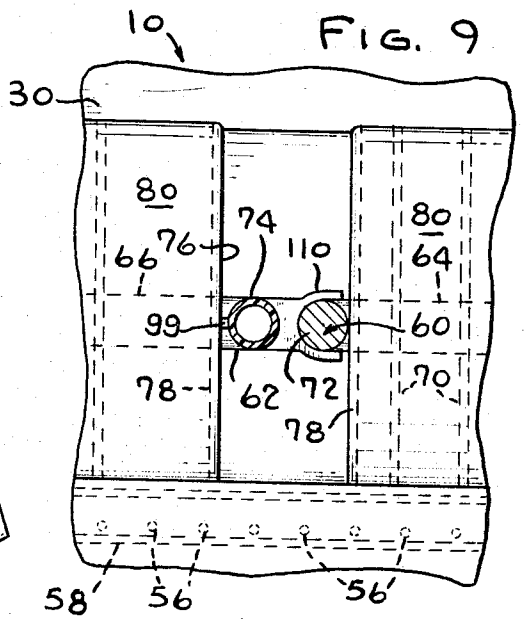


FIG. 8

FIG. 9



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Fig. 3

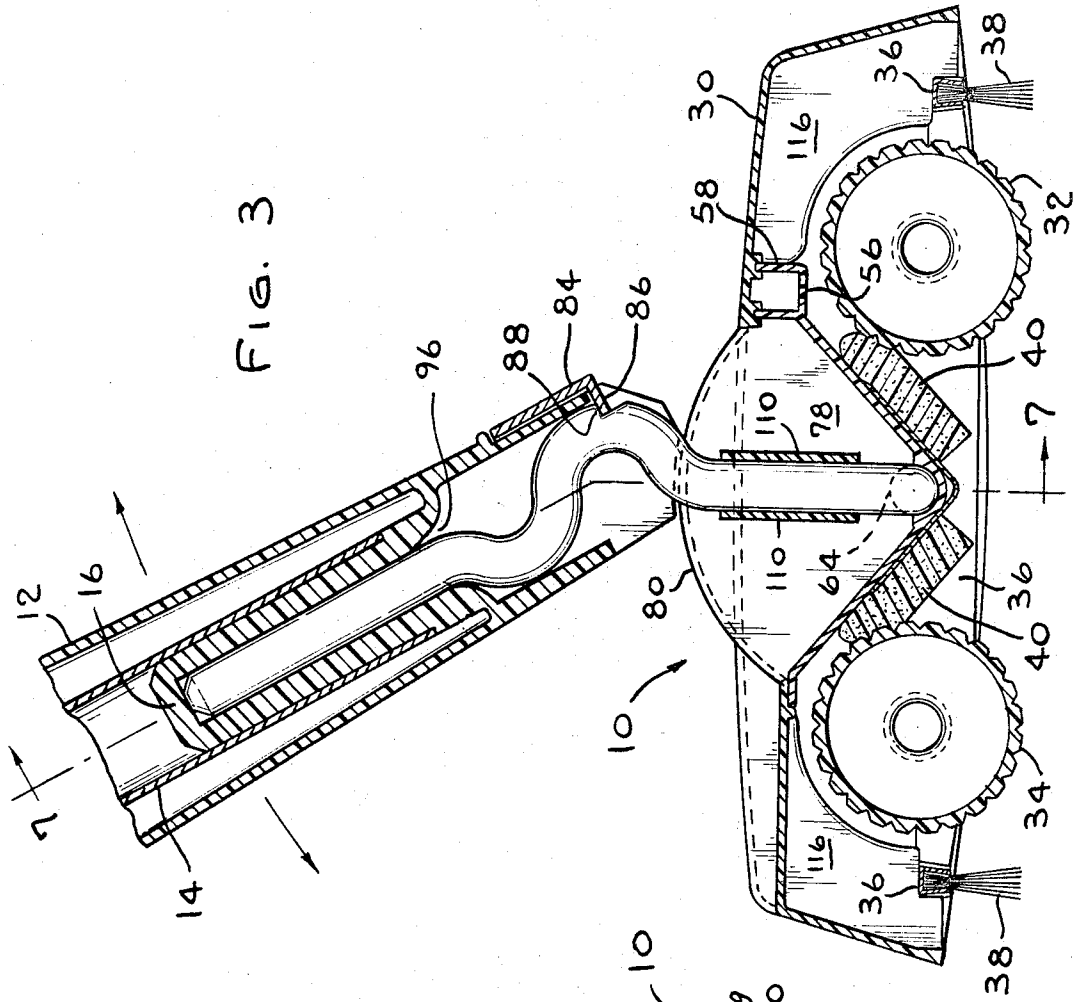
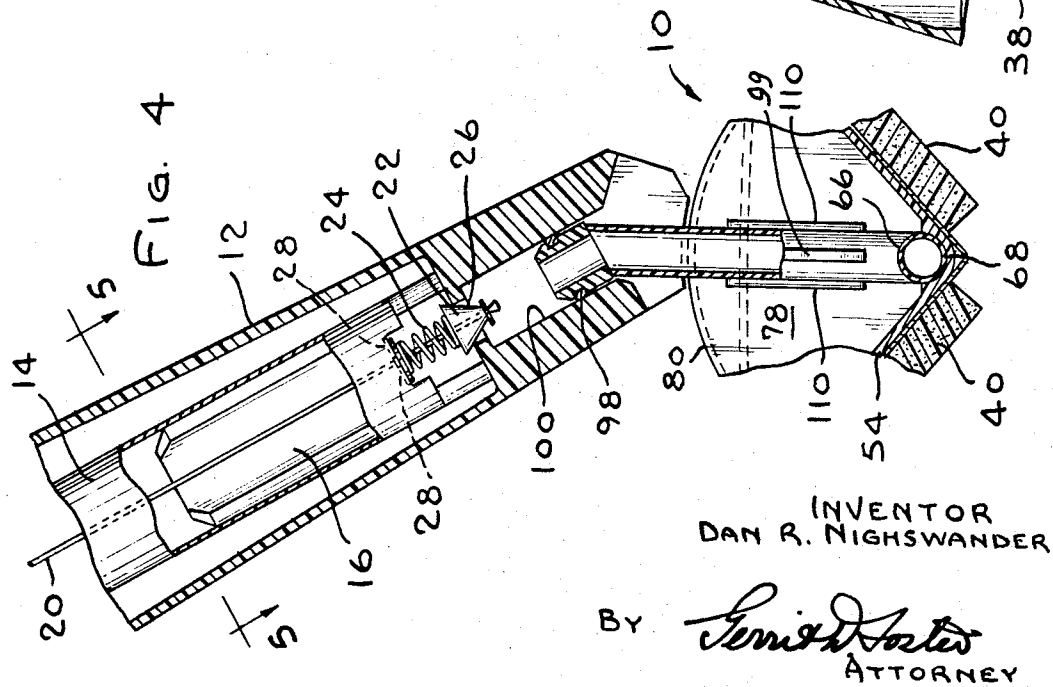


Fig. 4



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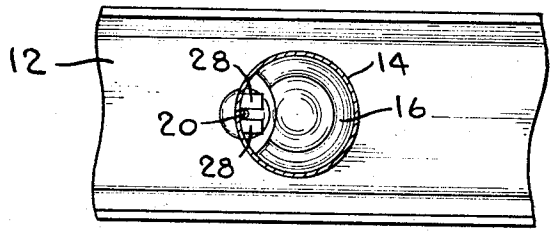


FIG. 5

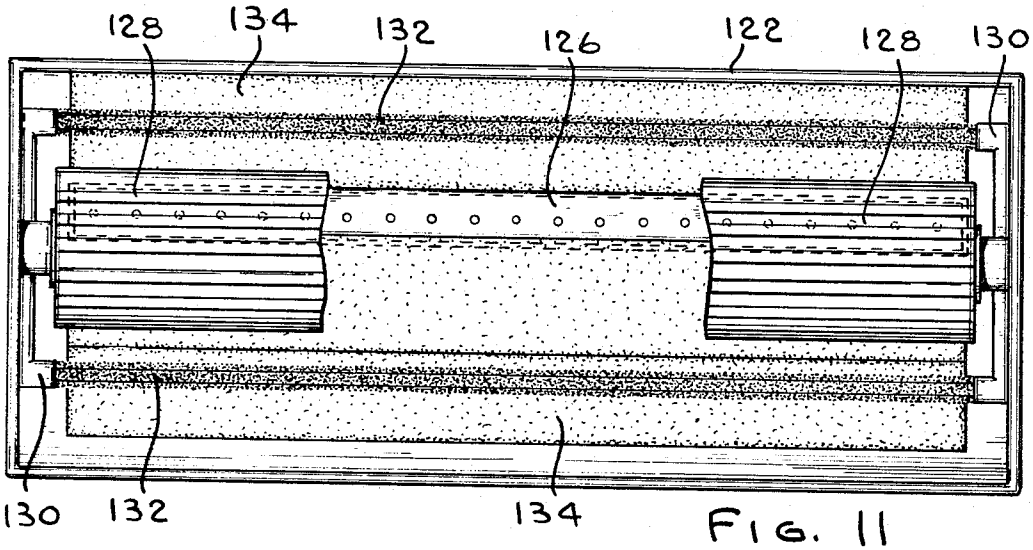


FIG. 11

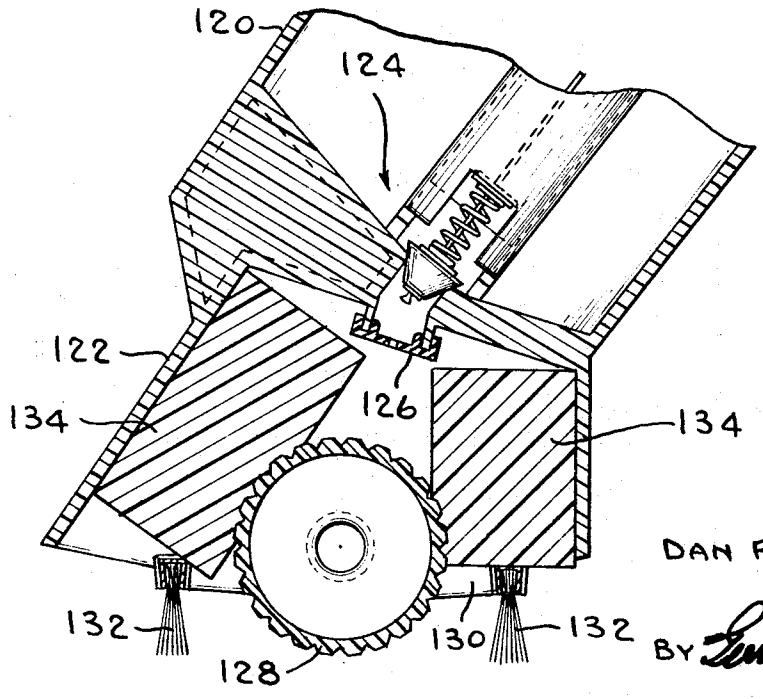


FIG. 10

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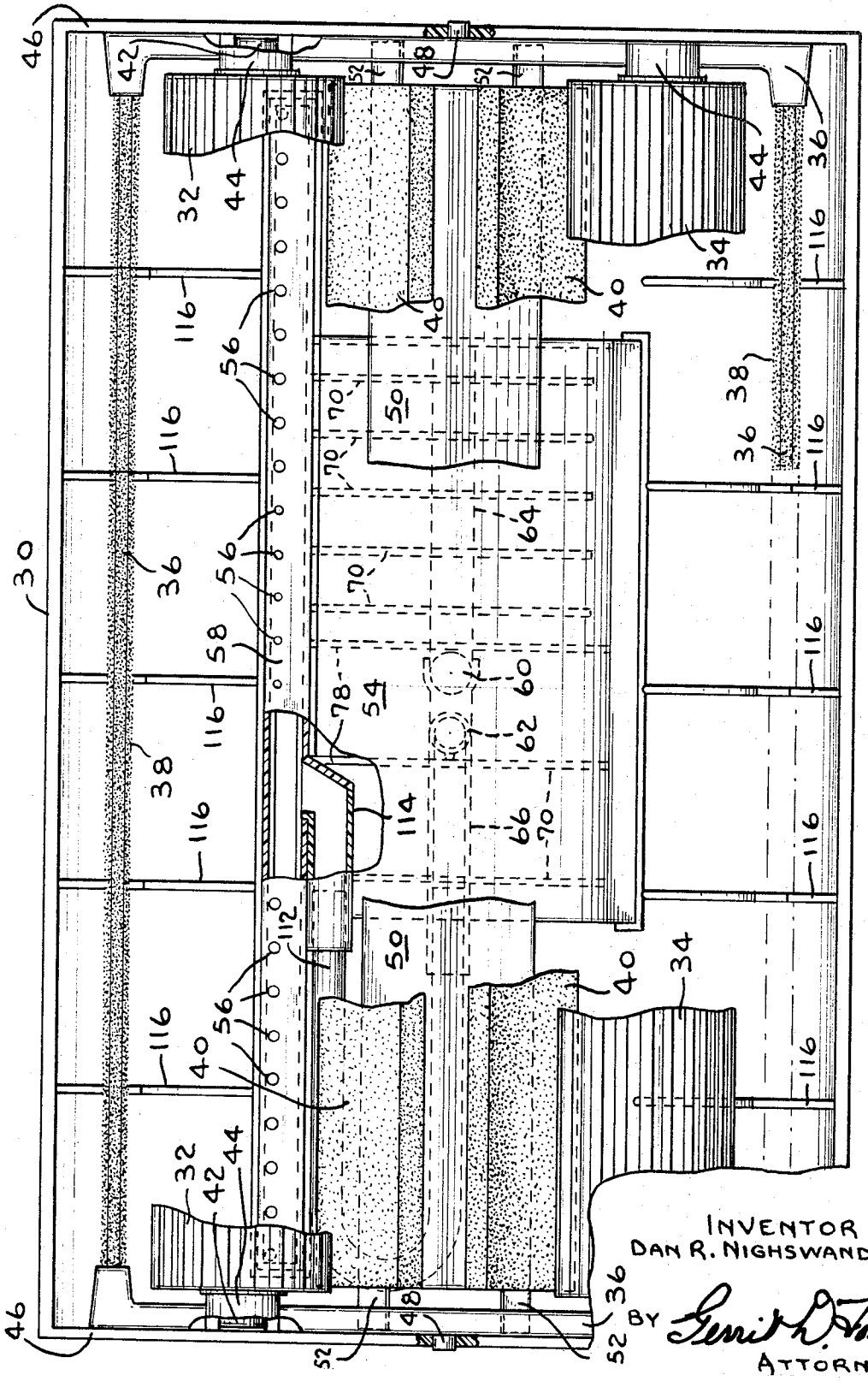


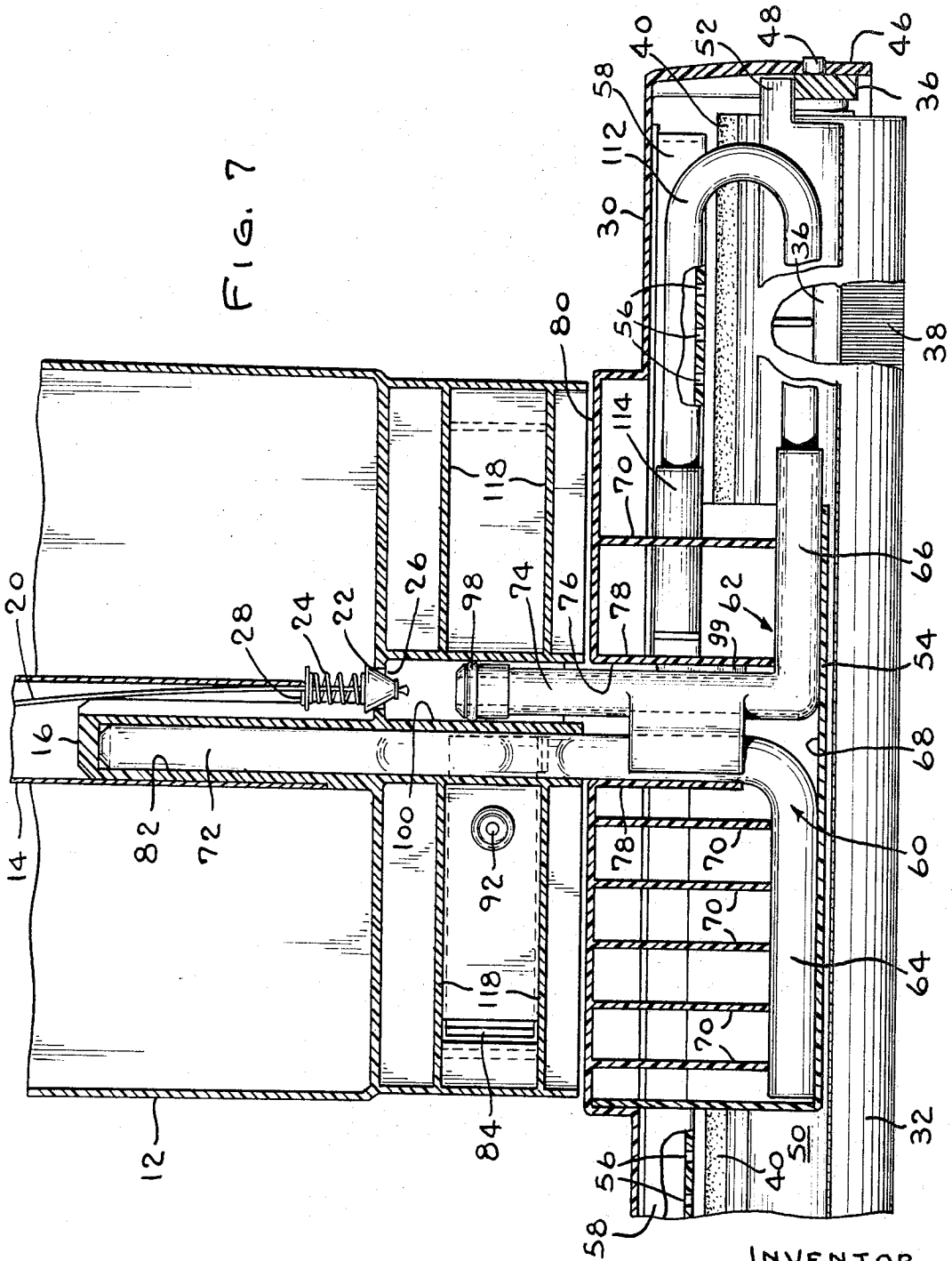
FIG. 6

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Fig. 7



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United States Patent Office 3,328,829 Patented July 4, 1967

3,328,829

CARPET SHAMPOOER

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Filed May 24, 1965, Ser. No. 457,961
9 Claims. (Cl. 15—533)

This invention pertains to improvements in carpet shampooers of the type in which liquid detergent is conveyed from a tank onto a roller which in turn conveys the detergent to the carpet to be cleaned and which, in combination with brushes located fore and aft of the roller, foams the detergent delivered to the carpet and permits it to penetrate the nap of the carpet.

The principal object of the present invention is to improve the cleaning action of carpet shampooers of this type by prefoaming a portion of the detergent prior to its delivery to the nap.

If the detergent is delivered without any prefoaming, as it is true of prior art shampooers, excessive detergent application soaks the nap to a point at which the cleaning is impaired. Since the amount of detergent application is controlled by the person using the shampooer, excessive detergent application was quite common. On the other hand, in prior art shampooers, in which the detergent is delivered in a fully foamed state, the detergent penetration is not thought to be sufficient, particularly so for carpets having a thick nap.

The underlying concept of the present invention is to prefoam the detergent by delivering it to a serrated, relatively rigid roller, and by agitating at least a portion of the detergent by virtue of a soft or resilient pad which contacts the serrated surface of the roller before the detergent is delivered to the nap.

A further object of this invention is to improve the cleaning action by providing means for picking up a portion of the detergent from the nap and redepositing it in a more agitated or foamed state. This object is esentially attained by the roller and resilient pad combination. The serrated roller not only passes the freshly delivered detergent past the resilient pad, but also picks up a portion of the detergent from the nap and redeposits it on the nap after it has been moved past the resilient pad. As it will be better appreciated from the more detailed description appearing further in the specification, this object may be accomplished in a single as well as a double roller shampooer.

A further advantage of the above described structure is that any dirt or lint particles which are picked up by the roller are removed from its surface by the resilient pad from which they can be removed when the shampooer is cleaned.

Thus, a further important object of the present invention is to provide a carpet shampooer having a dirt removal as well as detergent application feature.

A further object of this invention is to provide improved detergent conveying connecting means between the cleaning head and a pivotally mounted tank.

In essence this improvement resides in eliminating exposed flexible hosing at the joint between the tank and the cleaning head by utilizing a rigid tubular L-shaped member which has its upstanding leg removably connected to the tank and its lower leg pivotally connected to the cleaning head and communicating with the distribution channel thereof by means of flexible hosing hidden under the top panel of the housing.

Other objects and advantages will be pointed out in, or be apparent from, the specification and claims, as will obvious modifications of the embodiments shown in the drawings, in which:

FIG. 1 is a perspective view of a carpet shampooer embodying the present invention;

FIG. 2 is a front view of the latching mechanism connecting the detergent tank to the cleaning head;

FIG. 3 is a cross-sectional view taken on line 3—3 of FIG. 2;

FIG. 4 is a fragmentary cross-sectional view taken on line 4—4 of FIG. 2;

FIG. 5 is a fragmentary cross-sectional view taken on line 5—5 of FIG. 4;

FIG. 6 is a bottom plan view of the cleaning head with portions being broken away for the sake of clarity;

FIG. 7 is a cross-sectional view taken on line 7—7 of FIG. 3 with portions being broken away;

FIG. 8 is a cross-sectional view taken on line 8—8 of FIG. 2;

FIG. 9 is a cross-sectional view taken on line 9—9 of FIG. 2;

FIG. 10 is a cross-sectional side view of an alternative embodiment of the present invention; and

FIG. 11 is a bottom plan view of the carpet shampooer shown in FIG. 10.

Referring to the drawings in detail, the shampooer shown in FIGS. 1–9 is essentially a two piece unit which is comprised of a cleaning head **10** and a tank **12** removably attached thereto.

The tank is provided with a hollow handle **14** which projects through the top wall of the tank and is fixed to an upstanding boss **16**, which is molded integral with the tank's bottom structure. The detergent flow from the tank is controlled by a trigger **18**, which is connected by a wire **20**, to a resilient valve plug **22** which is biased by a spring **24** into sealing engagement with the edges of an outlet opening **26**. The upper end of the spring engages two inturned tabs **28** of the handle.

The cleaning head **10** is comprised of a housing **30**, two relatively rigid rollers **32** and **34** having serrated surfaces, a rectangular frame **36** carrying brushes **38**, and two resilient foam pads **40** each pressing against a portion of one of the rollers. The rollers are rotatably supported in the housing on stub shafts **42** which engage semicircular bearing surfaces **44** of the frame **36** and corresponding semicircular portions (not shown) provided in the sidewalls **46** of the housing. The frame **36** is removably secured in the housing by projections **48** which extend through appropriate apertures in the housing. The pads **40** are bonded to a V-shaped member **50**, which is removably secured in the housing by tabs **52** extending at each of its ends (one end only being shown in FIG. 7), and resting on the top surface of the frame **36**. The member **50** lies against a correspondingly V-shaped wall **54** which is bonded to or made integral with the housing **30**. Detergent is distributed over the roller **32** through apertures **56** located in the bottom wall of a distributor channel **58** located in the housing above the roller.

The connection between the tank and the cleaning head is essentially made by two L-shaped members, a load carrying member **60** and a detergent conveying member **62**, which have their lower or horizontal legs pivotally secured to the housing and have their upstanding legs received in adapter apertures provided in the bottom structure of the tank. This type of connection permits the tank and handle to be pivoted through an arc of approximately 90° in respect to the cleaning head.

The lower leg **64** of member **60** as well as the lower leg **66** of member **62** are rotatably mounted on the bearing surface **68** of the wall **54** and are retained thereon by the bottom edges of downwardly extending ribs **70**. The upwardly extending legs **72** and **74** of the corresponding members **60** and **62** project through an opening **76** formed between the two central ribs **78**. The other ribs are covered

by an arc-shaped roof **80** which is integral or is bonded to the housing.

When the tank is operably connected to the cleaning head, the upstanding leg **72** of the load carrying member projects into an aperture **82** provided in the boss **16**. It is retained in this position by a latch **84** which has its engaging tab **86** biased into engagement with a notch **88** provided in the leg **72**. As best seen in FIG. 8, the latch is pivotally secured to the lower wall projection **90** of the tank by a pin **92** and is biased in the engaging position by a spring **94**.

The entrance to the aperture **82** is somewhat enlarged and is tapered at **96** to permit the leg **72** to be guided to its proper position when the tank is connected to the head. The S-shape of the lower portion of the leg **72** permits the notch **88** to be properly aligned with the latch.

The detergent carrying member **62** is a relatively rigid tubular member and its upstanding leg **74** is provided with an O-ring seal **98** which sealingly engages the inner wall of an aperture **100** provided below the outlet opening **26** in the tank's bottom structure. The leg is provided with two tabs **110** which engage either side of the leg **72** to thereby permit the two legs to be pivoted as a unit. A bearing block **99** slidably engages rib **78**. Because leg **72** is substantially longer than leg **74**, the latter will be inherently aligned with the aperture **100** when the tank is connected to the cleaning head. A flexible hose **112** connects the lower leg **66** to an inlet **114** of the distribution channel **58**.

Suitable ribs **116** and **118** are provided in the housing **30** and the tank **12** respectively to provide the required structural strength for these members.

During its use the shampooer is advanced back and forth over the carpet. When it is moved in the direction from right to left when viewed in FIG. 3, the detergent delivered to roller **32** is moved through the contact area of the pad **40** and roller **32**, and is agitated or partially foamed prior to its delivery by the roller to the nap to be cleaned. Once delivered to the nap, the detergent is further foamed by the action of the brushes which spread apart and scrub the nap. The second roller **34** picks up a portion of the detergent delivered during the previous stroke from the nap and moves it through the contact area of pad **40** and roller **34** to further agitate and foam the detergent. During the travel in the other direction the detergent is delivered directly to the nap by roller **32**, but a portion thereof is picked up by both rollers and is foamed by virtue of travel past the pads **40**. In either event the roller tends to pick up loose dirt and lint and deposits it in the nip formed by the rollers and the pads from where it can be conveniently removed when the shampooer is cleaned.

The second embodiment of a modification of the present invention is shown in FIGS. 10 and 11. In this embodiment the tank **120** and the housing **122** are integral and the detergent delivery is accomplished through valving **124** and a distribtuion channel **126** equivalent in structure to the corresponding parts described in the earlier embodiment. Also, the relatively rigid serrated roller **128**, frame **130**, and brushes **132** are equivalent in structure and function to the corresponding earlier described structure. In this embodiment two resilient foam pads **134** are provided, one located fore and the other aft of the roller to thereby cause freshly delivered detergent to be always moved past and prefoamed by the pads before its delivery to the carpet. The foaming and lint or dirt pick up features of this embodiment are much alike to the earlier described model.

Although several embodiments of the present invention have been illustrated and described, it will be apparent to those skilled in the art that various changes and modifications may be made therein without departing from the spirit of the invention or from the scope of the appended claims.

I claim:

1. A carpet shampooer comprising:
a housing;
roller means rotatably carried by said housing;
brush means carried by said housing and positioned fore and aft in respect to said roller means and adapted to scrub the carpet to be cleaned;
detergent supply means adapted to supply a controlled amount of detergent to the surface of said roller means for delivery thereby to the nap; and
resilient pad means pressed against said roller means to thereby agitate the detergent as it is brought through the contact area of said pad means and said roller means before its delivery to the carpet by said roller means.

2. A carpet shampooer comprising:
a housing;
a relatively rigid roller having an intaglio surface and being rotatably carried by said housing;
brush means carried by said housing and positioned fore and aft in respect to said roller and adapted to scrub the carpet to be cleaned;
detergent distributor means operable to deliver detergent to the surface of said roller, and resilient pad means pressed in contact with said roller to cause during back and forth cleaning movement of the shampooer a portion of the detergent delivered to said roller to pass through the contact area between said roller and said pad means and to be prefoamed thereby prior to its delivery to the carpet.

3. A carpet shampooer according to claim **2** including a second relatively rigid roller positioned parallel to and having an intaglio surface, and having second resilient pad means in contact with said second roller to cause said roller to pick up a portion of the detergent delivered to the carpet to be picked up by said intaglio surface of said second roller and to be agitated by virtue of passing through the contact area between said second roller and said second resilient pad means.

4. A carpet shampooer according to claim **3** including a detergent tank and connecting means for removably securing said tank to said housing, said connecting means including an L-shaped load bearing connecting member having its lower end pivotally secured to said housing and having its upstanding leg removably fixed by latching means to said tank.

5. A carpet shampooer according to claim **4** wherein said connecting means also includes an L-shaped tubular detergent conveying connecting member having its lower end pivotally secured to said housing and having its upstanding leg disengageably connected to said tank for receiving detergent therefrom.

6. A carpet shampooer according to claim **5** including means connecting said upstanding legs of said two connecting members to permit them to be pivoted as a unit in respect to said housing.

7. A carpet shampooer according to claim **2** wherein said resilient pad means is comprised of sponge material.

8. A carpet shampooer according to claim **2** wherein said resilient pad means is located on both sides of said roller to thereby cause detergent delivered to said roller to pass through a contact area between said pad means and said roller regardless of the direction of rotation of said roller.

9. In a carpet shampooer, the subassembly for delivering liquid detergent from a tank, which is pivotally connected to a cleaning head, to a detergent distributing channel located in the cleaning head, the subassembly comprising:
an L-shaped tubular connecting member having its lower leg pivotally connected to the cleaning head, and having its upstanding leg connected to said tank for receiving detergent therefrom; and
flexible hosing connected at one of its ends to the open end of said lower leg and at the other of its ends to

the distributing channel for delivery of detergent thereto regardless of the pivotal motion of the tank in respect to the cleaning head.

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