United States Patent [19]

Hermann, Jr.

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[54] **MOLDED BRUSH HEAD**

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[52] **U.S. Cl.** **15/176**, 15/187, 249/176, 425/416

[51] **Int. Cl.** **A46b 1/00**

[58] **Field of Search** ...306/30; 18/42, 39, 34; 15/176, 15/171, 145, 187; 249/59, 175, 184, 176, 131; 425/416

[56] **References Cited**

UNITED STATES PATENTS

3,524,210 8/1970 McLean 15/145

3,431,967 3/1969 Hipp, Jr. .....18/45 R X

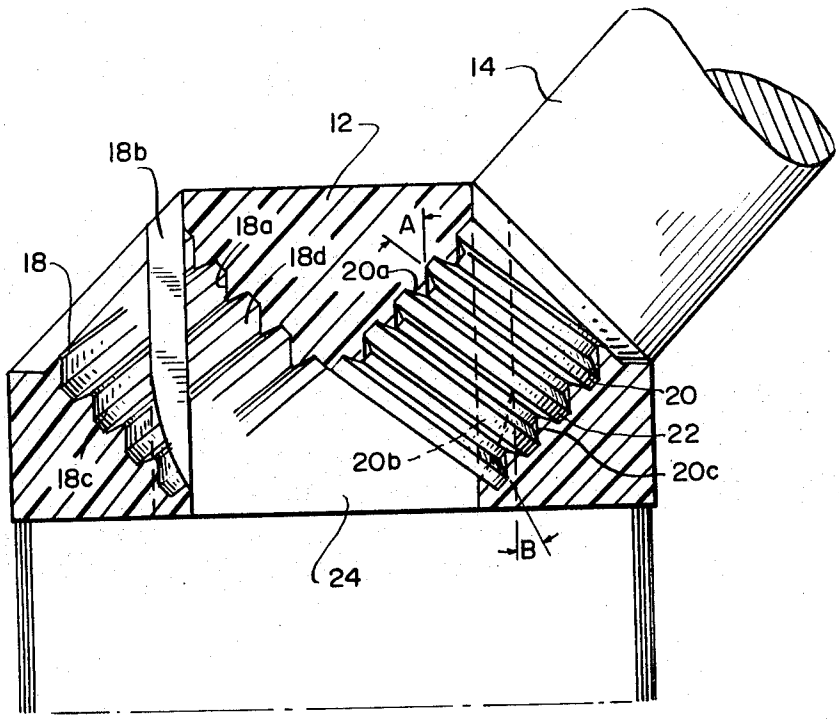
Primary Examiner—Leon G. Machlin

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[57] **ABSTRACT**

A brush head of pushbrooms, or the like, with molded threads so that threaded handles can be screwed therein. The threads formed in such brush head have thread deformations that are formed by protuberances located on a pair of mold parts of such configurations so that the contoured portions formed by the mold parts closely approximate a complete thread within the respective openings to receive a threaded end of a broom handle. The contoured portions of the mold parts are fashioned to provide a zero draft or taper angle between the mold parts and the threads formed thereby so that linear parting of the mold parts is then possible. A pair of angularly disposed threaded openings can be formed by the mold.

5 Claims, 5 Drawing Figures



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SHEET 1 OF 2

FIG.1

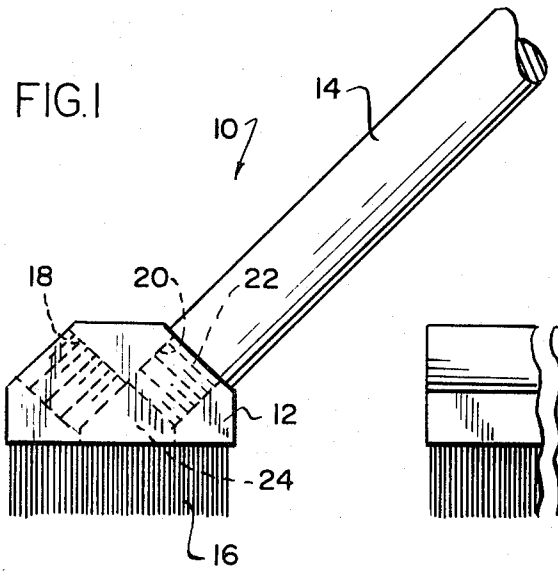


FIG.2

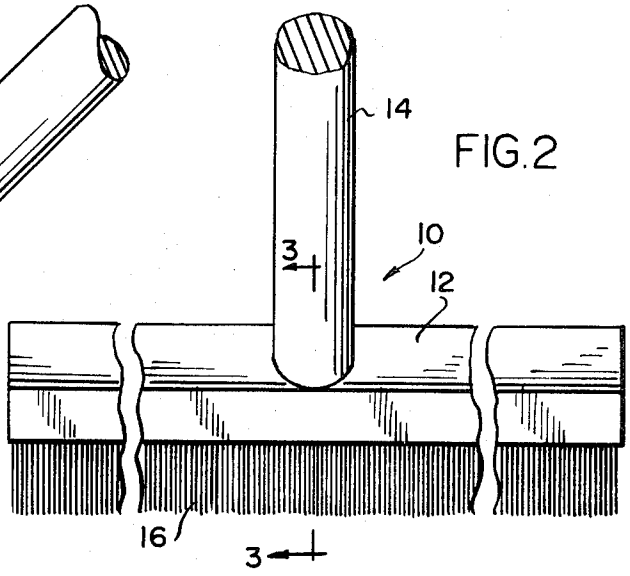
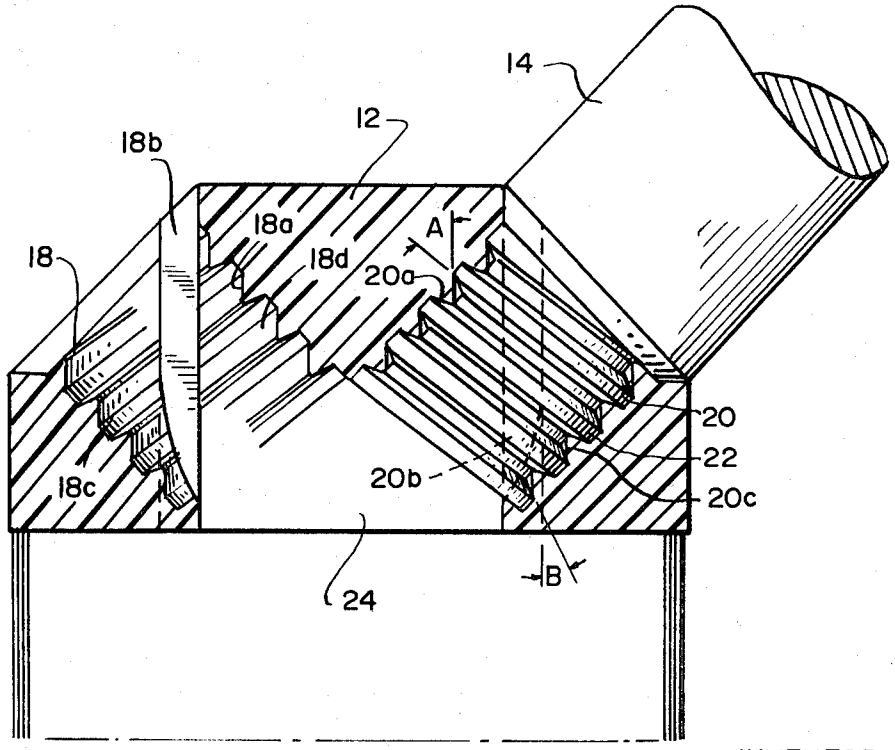
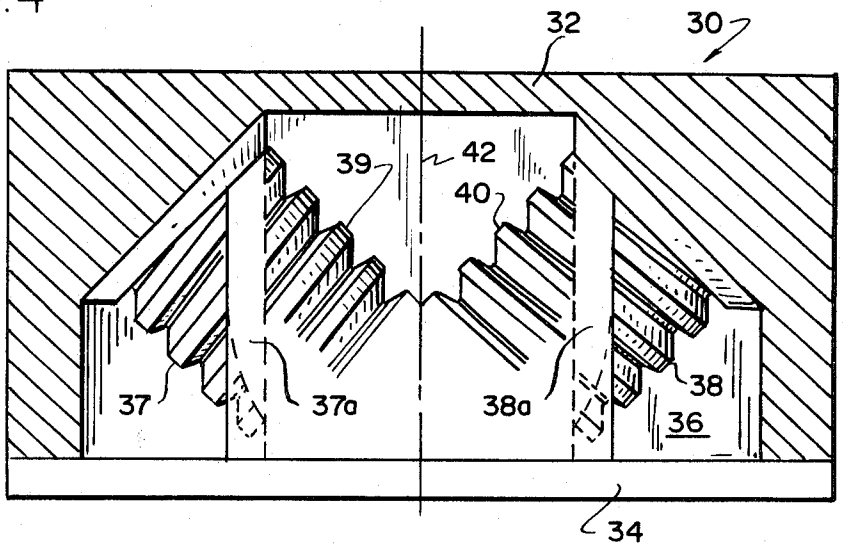


FIG.3



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FIG. 4



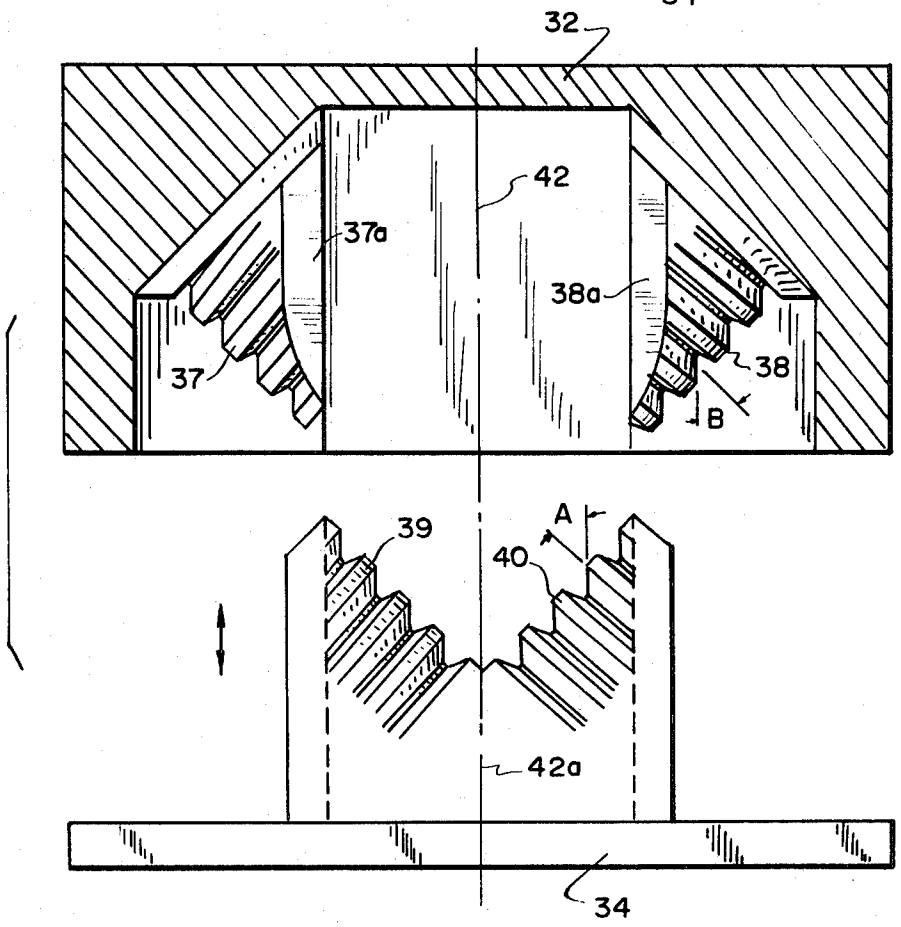


FIG. 5

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MOLDED BRUSH HEAD

BACKGROUND OF THE INVENTION

Heretofore, pushbrooms have been formed by a brush head from which extends a multitude of bristles used for sweeping. The brush head, which may be of wood or plastic, would have a threaded opening formed in at least one end or side thereof and conveniently at an angle of about 45° to receive a threaded broom handle. Heretofore, this internal thread was formed by a machining operation which is rather expensive. To provide maximum usability of the brush head, a second threaded opening is provided in the other side of the brush head, also at a 45° angle, into which the same handle can be threaded when the bristles on the broom were bent backward or in a direction to become substantially ineffective. Thus, by alternately changing the broom handle from one threaded opening to the other threaded opening, maximum broom life can be obtained.

In manufacturing pushbrooms of this type, there is a rather extensive and expensive machining operation to form the threaded openings in the brush head. While it is an absolute necessity to machine the threaded openings when the brush heads are made of a solid block of wood, this machining operation becomes an extra and unnecessary step when making the brush head of one of the modern moldable plastic materials. However, heretofore molding a part, such as a brush head for a pushbroom, with an internal thread on two sides of the brush head required elaborate devices, as for example, the use of disposable sand formed slugs, somewhat like a lost wax process, which would be destroyed after the brush head was molded to leave behind a threaded cavity. That is, the sand slug would be removed, by breaking it apart, from its location within the brush head, thus leaving behind a formed threaded opening or cavity. This is a relatively expensive and impractical procedure when manufacturing items of low cost, such as janitor brooms.

SUMMARY OF THE INVENTION

An object of this invention is to provide an improved brush head for a pushbroom which is less expensive to manufacture.

Another object of this invention is to provide a molded brush head wherein threaded openings are formed within the brush head during the molding process.

The molded brush head for a push broom of this invention is formed by use of a mold assembly having two mold parts which move linearly with respect to each other and form a cavity to receive plastic material. The two parts of the mold each have configurated protuberances extending therefrom symmetrically in diametrically opposed relation to one another. A threadlike contour is formed by the configurated protuberances closely to approximate continuous threads formed within the openings, and these threaded openings will readily receive the threaded end of a broom handle.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a side view of a pushbroom using a brush head constructed in accordance with this invention;

FIG. 2 is a rear view of the broom of FIG. 1;

FIG. 3 is an enlarged, sectional view taken along broken line 3—3 of FIG. 2;

FIG. 4 is an assembled sectional view of a mold assembly used to form the brush head of FIGS. 1, 2 and 3; and

FIG. 5 is a view showing the mold assembly of FIG. 4 in a separate condition and which condition is achieved by moving the mold parts linearly in reciprocal direction from one another along their coextensive axes.

DESCRIPTION OF THE PREFERRED EMBODIMENT

Seen in FIG. 1 is a side elevational view of a pushbroom which is designated generally by reference numeral **10**, and which includes a brush bar or head **12** adapted threadily to receive a broom handle **14** in the usual and well-known manner. Bristles **16**, of hair or nylon, or the like, extend from the brush head **12** for sweeping surfaces such as floors. Most advantageously, a pair of threaded openings **18** and **20** are formed on opposite sides of the brush head **12** and, by way of example, may be located at angles of approximately 45° from the vertical axis of the brush head, it being understood that any suitable angle of displacement of these threaded openings may be incorporated. The broom handle **14** has a threaded end **22** formed thereon so as to mate with the threaded openings **18** and **20** formed in the brush head **12**.

When a broom such as this is used for an extensive period of time, the bristles **16** on the brush head **12** tend to bend rearwardly, in the direction of the extended broom handle, and these bristles then become less efficient in their sweeping function. To revive and enhance the sweeping capabilities of the bristles, the broom handle **14** can be removed from the threaded opening **20** and then inserted into the threaded opening **18**, which then causes the bent bristles to face forward for good sweeping action, at least until such time as they again bend backward toward the handle. The handle **14** can be unscrewed from the opening **18** and put back into the opening **20** to once again improve the sweeping capabilities of the broom.

Referring now to FIG. 3, the brush head **12** is here illustrated in the cross section and is made of moldable material, such as plastic, or the like, and is fashioned by utilizing the mold assembly illustrated herein. The threads **18*a*** and **20*a*** within the threaded openings **18** and **20**, respectively, have threaded portions thereof removed, i.e. not formed in accordance with their usual configuration, and which is referred to herein as thread interruptions or deformations, which are arranged to provide draft or taper between the two mold parts and the brush head formed thereby. This zero draft or taper angle, or what is sometimes referred to herein as thread interruptions or deformations, allows the mold parts to be linearly separated to remove the molded brush head therefrom. This thread interruption is illustrated in FIG. 3 and is shown by an angle A formed between the substantially vertical portion of the thread **20*a*** and a position where the thread would otherwise been formed in the usual case so as to engage with the threaded end **22** of the handle **14**. The amount of material, i.e. moldable plastic, that is missing from the angle A is the thread interruption or deformation

referred to above. This absence of material does not decrease the effective holding capabilities of the threads, but does allow a substantial reduction in the cost of manufacturing the brush head by now allowing the mold parts to be a linearly partable structure. Similarly, angle B, formed at the bottom thread portions of the thread **20***a*, corresponds to an absence of material like that of angle A, but which absence of material is caused by the other of the two mold parts.

The threaded opening **18** illustrates a non-threaded vertical segment **18***b* which is a separation area between the two thread-like contours **18***c* and **18***d* and is formed by the mold assembly of this invention, it being understood that the thread opening **20** has the same configuration. Thus, the thread-like contours **18***c* and **18***d* are each less than one-half the circumference of the opening in which they are formed. However, the thread-like contours or segments **18***c* and **18***d* cooperate to approximate a full thread within the brush head **12**. The non-threaded segment **18***b*, which is between the threaded segments **18***c* and **18***d*, does not affect the holding characteristics of the threaded end **22** within either the threaded openings **18** or **20**, but does allow a thread free area between mold parts whereby the molded parts can be easily separated without interference.

For a better understanding of the mold parts used to form the brush head **12**, reference is now made to FIGS. **4** and **5** wherein a mold assembly **30** is illustrated as being formed of two linearly partable mold parts **32** and **34**. The upper mold part **32** and the lower mold part **34** cooperate along their coextensive axes, indicated by the broken line **42**, and form a cavity area **36** corresponding to the contour of the brush head **12** which is formed thereby. The upper mold part **32** has a pair of configurated protuberances **37** and **38** extending downwardly therefrom and fashioned to form threadlike contours **18***c* and **20***c*, respectively, over a first threadlike contour or segment of the threaded openings **18** and **20** formed in the brush head **12**.

The lower mold part **34** also has a pair of configurated protuberances **39** and **40** extending upwardly therefrom, and substantially located in the center of the mold part. The configurated protuberances **37** and **39** in an assembled condition are diametrically opposed one another, along a line approximately 45° from the central axes **42** of the mold **30**, and these configurated protuberances cooperate with one another to approximate a full thread within the opening **18** of the brush head **12**. Similarly, the configurated protuberances **38** and **40** cooperate with one another to approximate a full thread within the opening **20**, and these threads provide the necessary engaging thread-like contours or segments within their respective openings to become engaged with the threaded end **22** of the handle **14** as shown in FIG. **3**.

Referring now, more particularly, to FIG. **5**, it is seen that the upper mold part **32** and the lower mold part **34** are clearly linearly partable along their central coextensive axes **42** and **42***a*, respectively, and that the parting of these mold parts will not interfere with the formation of the threaded openings **18** and **20** formed thereby. As seen in FIG. **3**, the rectangular opening **24** in the bottom of the brush head **12** forms a regress for the central portion of the lower mold part **34** which has the configurated protuberances **39** and **40**. As mentioned above, the opening **24** can be plugged with suitable plastic material after the brush head is removed from the mold. Also, the material which goes into the opening **24** may have bristles fastened thereto so that the bottom of the brush head **12** will be completely covered with bristles. However, it will also be understood that bristles may be located only on opposite sides of the opening **24** and that no additional material need be added into the opening.

What has been described is a simple mold assembly having two linearly separable mold parts for forming brush heads for pushbrooms, and which cuts the cost of manufacturing such brooms. Although it is here illustrated that the mold assembly **30** has means for forming two threaded openings in the brush head **12**, it will be understood that the same concept can be used to form but one threaded opening, as well as three or more threaded openings. Furthermore, the concept of this invention can be used to form threaded openings in bodies other than brush heads for pushbrooms. Accordingly, variations and modifications of this invention may be effected without departing from the spirit and scope of the novel concepts disclosed and claimed herein.

I claim:

1. A head for a workpiece including, a body of molded material having a working portion, at least one threaded opening formed in said body on a side thereof displaced from said working portion, said threaded opening having a plurality of internal threads with thread interruptions therein which allow linear parting of mold pieces during manufacturing of the head, said threads permitting entrance of a threaded handle and providing secure threaded interconnection therewith.

2. The head of claim **1** wherein said body of molded material has a threaded opening on each side of the head and the axis of one opening is at an angle with respect to the axis of the other opening within a range of 40° to 135°, and both openings are at an angle with respect to the vertical axis of the head within a range of 20° to 60°.

3. The head of claim **1** wherein said body of molded material has a threaded opening on each side of the head and the axis of one opening is at an angle of 90° with respect to the other opening, and both openings are at an angle of 45° with respect to the vertical axis of the head.

4. A brush head for a pushbroom including in combination,

a body of molded material having one substantially flat side and adapted to hold brush bristles,

a plurality of bristles secured to said body and extending from said one side of said body,

a pair of threaded openings formed in said body on the side thereof opposite to said one side, with the axis of each opening being at an angle within the range from 20° to 60° with respect to an axis perpendicular to said one side,

said threaded openings each having a plurality of internal threads with interruptions in said threads on opposite sides of said openings to allow linear parting of mold pieces during molding of the brush head, said threads in each opening being adapted to cooperate with a threaded broom handle to provide secure threaded interconnection therewith.

5. The brush head of claim 4 wherein the axis of one opening is at an angle of substantially 90° with respect to the axis of the other opening, and the axes of both openings are at angles of substantially 45° with respect to the axis perpendicular to said one side.

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