

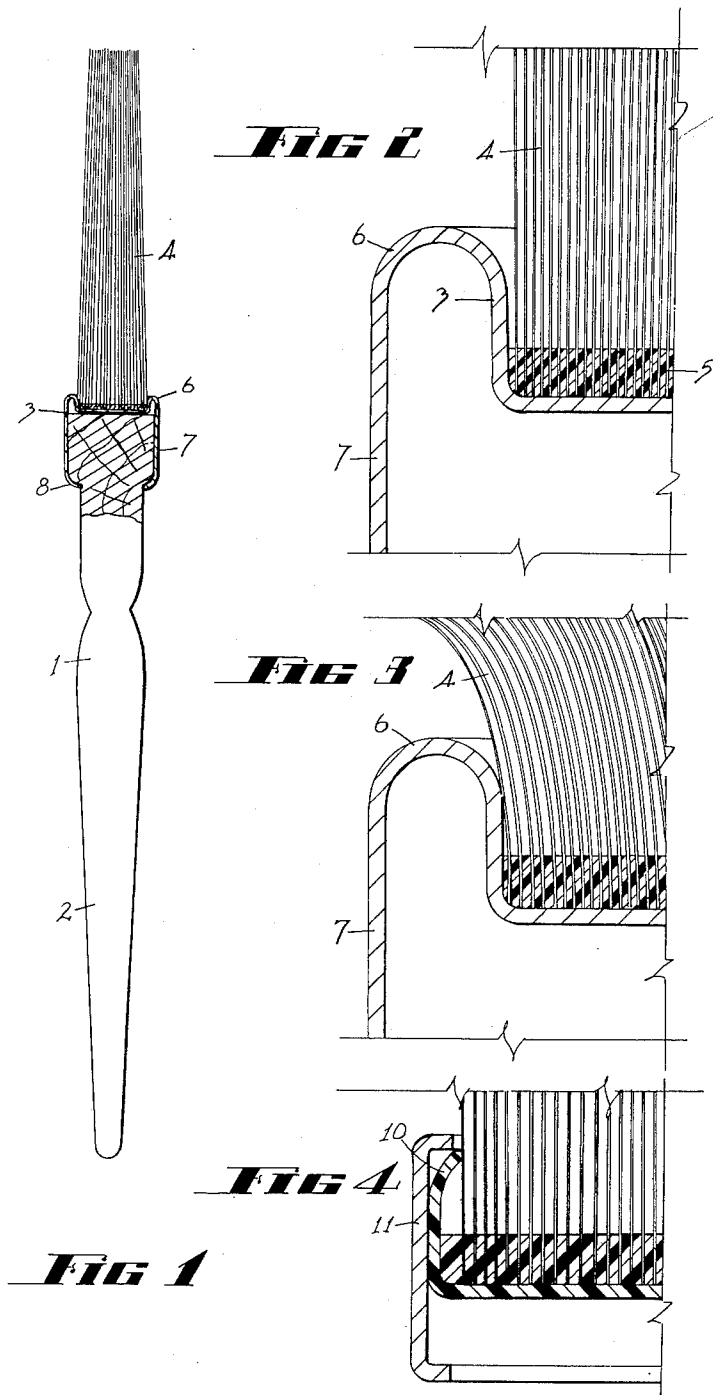
May 1, 1962

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3,031,708

BRUSHES AND THEIR MANUFACTURE

Filed Dec. 7, 1959



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**BRUSHES AND THEIR MANUFACTURE**

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Filed Dec. 7, 1959, Ser. No. 857,718

Claims priority, application Australia Dec. 8, 1958

2 Claims. (Cl. 15—193)

This invention relates to improvements in and to the manufacture of brushes particularly those intended for painting.

In the manufacture of paint brushes it is desirable that the bristles have the highest possible degree of paint-holding or "take-up" capacity, that the bristles have the ability to transfer paint so taken up to the surface being painted, and that good shape retaining qualities are given to the bristles thus to provide good "cutting-in" ability meaning the ability to paint to a straight edge or line without the use of artificial aids such as straight edge rules or masking tapes.

In many cases paint holding capacity has been thought to be provided by inserting into the root ends of the bristles within the usual metal ferrule one or more wedges, plugs or bristle spacing members the idea being that the resultant gap or gaps in the bristles could provide convenient wells or traps for the holding of paint. It has been common usage in the trade for most paint brushes to be provided with such wedges or plugs.

A great disadvantage of such construction has been that in normal brush usage the gaps or wells so formed in the bristles become filled with paint and thereafter when the brush is flexed back and forth in vigorous work the gaps tend to close thus forcing the paint outwardly whence it runs down the handle or alternatively splashes or drips from the brush. This is particularly noticeable when the brush is used in the overhead position as on ceilings.

All natural bristles carry on their outer surface series of overlapping scale-like formations. Commencing at the flag or thinner end of each strand or hair the scales overlap one set above the other as they progress towards the thick or root end. It is this overlapping scale-like formation which can be very effective in the transfer of paint from the root end of the bristles towards the tip and thus to the surface requiring to be painted.

In order to utilize this scale-like formation for such purpose it will readily be appreciated that each bristle must possess full flexibility. The ability of all the bristles to bend and flex throughout their full length is most important if full advantage is to be taken of this capacity in bristles to transfer paint continuously in the one direction, namely toward the tip of the brush. In the usual or common method of brush construction the introduction of wedges, plugs or other bristle spacing members has caused the bristles to be tightly packed in the ferrule or other bristle containing member which in turn has restricted the flexibility of the bristles for a distance of some half inch or even longer from the ferrule.

The introduction of wedges, plugs or other bristle spacing members causing the bristles to be tightly packed within the ferrule or other bristle containing member has the disadvantage referred to above which is noticeable immediately the brush is put into use. When the brush is soaked in water or other solvent considerable pressure can be quickly generated within the ferrule consequent upon the natural tendency of the bristles to absorb fluid, as well most setting or bristle bonding cements are absorbent to some degree and as well the plugs or spacing members particularly if same be made of wood as is commonly the practice are absorbent. Following such

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absorption swelling takes place and immerse pressure can be built up within the ferrule or bristle containing member. This is evidenced by a tendency for the bristles to open outwardly at the tip or flag end. Such defect renders accurate "cutting-in" impossible. One method of dealing with this difficulty is for a painter to use a special "cutting-in" brush, one in which the maker has cut away the outside edges of the bristles so that the resultant chisel-like shape at the tip of the brush remains fine and sharp. Thus painting to an accurate edge or line is possible.

The objects of this invention are to provide improvements in brushes and their manufacture so that paint holding capacity in the bristles is substantially increased, the ability to transfer the paint to the surface being painted is rendered more speedy and efficient and the desirable shape retaining quality of the bristles is manifestly increased so that "cutting-in" with accuracy is rendered easier and faster. A further object of the invention is to provide a brush which can be cleaned far more easily and quickly than can brushes made by conventional means. This is of particular advantage when it is necessary to paint many areas in a day of different colours such that is impractical or uneconomical to maintain a separate brush for each colour and repeated cleaning is necessary in order to permit rapid change of colour.

In its simplest form the invention lies in the improvements comprising the use of a shallow hollow shell, means to secure the shell to a handle, a setting compound in the shell and bristles bonded or otherwise fixed into the hollow shell so that the root ends thereof are not tightly packed.

The invention will be described in some detail with reference to an embodiment illustrated in the accompanying drawings in which:

FIG. 1 is a fragmentary section of a paint brush according to the invention,

FIG. 2 is an enlarged view showing the root ends of bristles in setting compound in a hollow shell,

FIG. 3 illustrates the effect of flexing of the bristles, and

FIG. 4 illustrates an alternative shell and ferrule arrangement.

Referring first to FIGS. 1 and 2, a paint brush 1 comprises a handle 2, a hollow shell 3, and a tuft of bristles 4 with their root ends in setting compound 5 in the hollow shell 3. The hollow shell 3 has an upstanding rolled rim 6 and a depending marginal flange 7, the lower edge 8 of the marginal flange 7 being turned inwardly to engage the handle 1.

The bristles 4 are bonded or otherwise fixed into the shell 3 so that the root ends thereof are not tightly packed. In a preferred example of this invention, the bristles which are bonded so as to occupy a space or total area approximately one third to one half greater than they would if confined or packed tightly in position by means of wedges, plugs or conventional gap forming members or by any other means forcibly inserted in the bristles.

Because the bristles are not forced or packed tightly in a mass and because of their cross-sectional round or ovate shape, there is a minute space between each bristle and its neighbours thus forming multitudinous voids possessing considerable power of capillary attraction. This particular feature increases greatly the paint holding capacity of the brush.

Furthermore as a result of this improved arrangement of the bristles any paint taken up is more evenly distributed throughout the entire bristle mass and the holding of paint in comparatively large gaps or wells deliberately formed in the bristles by wedges or plugs is eliminated and with it most of the tendency for paint to

be forced outwardly from the side of the brush during normal vigorous usage.

Furthermore another great advantage flowing from the improved arrangement of the bristles within the ferrule or containing member is that the bristles are fully flexible from the point where they emerge from such ferrule. This permits their bending and flexing throughout their entire length and thus full effect is given to the natural ability of the bristle to move paint continuously toward the tip or flag end due to the overlapping scale formation which is a feature of hog bristles.

Furthermore brushes made according to this invention do not exhibit the same tendency to develop internal swelling following upon soaking in water or other solvent. The absence of the usual wooden or other wedges or plugs is advantageous, and if the bristles themselves or the setting or bonding medium tend to expand, because the bristles themselves are bonded together in a position of mere contiguity rather than the heretofore common practice of tight packing, any such expansion can be accommodated without the intense swelling and consequent internal pressures usually encountered; all of which cause the bristles to splay outwardly at the tip or flag end rendering accurate "cutting-in" extremely difficult or impossible. Use of conventional brushes on edge for "cutting-in" purposes causes opening out or "fingering" of the bristles. A feature of this invention is that even a new, unused brush of any size can be dipped in paint and used immediately on edge to "cut-in" or paint to an accurate edge or line.

A further advantage of this invention is that the brushes can be far more easily cleaned than brushes made by conventional means. Because of the full flexibility of the bristles paint as already explained tends to be worked towards the tip of the brush. Thus at all times there is less residual paint in a brush after painting is completed and thus less material to be cleaned out. Furthermore because of the multitudinous voids formed between the bristles entry of cleaning solvent or compounds is facilitated and thus cleaning of residual or dried paint is rendered comparatively easy and much faster.

The method of bonding or otherwise positioning the bristles prior to fixing into the hollow shell is achieved by holding the desired quantity of bristles intermediate their ends to cause the root ends to occupy the desired

area and a bunch of bristles held in this way can then be positioned into the shallow member into which the setting compound has been previously placed, the setting compound being then cured or otherwise treated to effect a permanent hold between the hollow shell and the bristle.

The invention can be applied to bristle of natural materials or synthetic brush material may be used for this purpose.

The shell according to the above embodiment is formed of metal, but it could if desired be of plastic of suitable strength and resistance to solvents. Such a shell 10 is illustrated in FIG. 4, and is used in conjunction with a ferrule 11 to retain the shell to the handle. Alternatively the shell may be cemented or otherwise secured direct to the end of the handle.

What is claimed is:

1. Improvements in and relating to paint brushes, comprising a shallow hollow shell, means on said shell to secure said shell to a handle, a setting compound in said shell, and bristles loosely packed at their root ends in said setting compound in said hollow shell so that the area occupied by the root ends of the bristles is between one third and one half greater than the area occupied by the bristles if tightly packed.

2. Improvements in and relating to the manufacture of paint brushes comprising the steps of forming a shallow hollow shell, applying a quantity of setting compound in said hollow shell, holding a bunch of bristles intermediate its length whereby the root ends of the bristles will spread to an area between one third and one half greater than the area occupied by the bristles if tightly packed, inserting the so spread root ends of said bristles into said setting compound, curing said setting compound with the root ends so spread, and securing said hollow shell to a handle.

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