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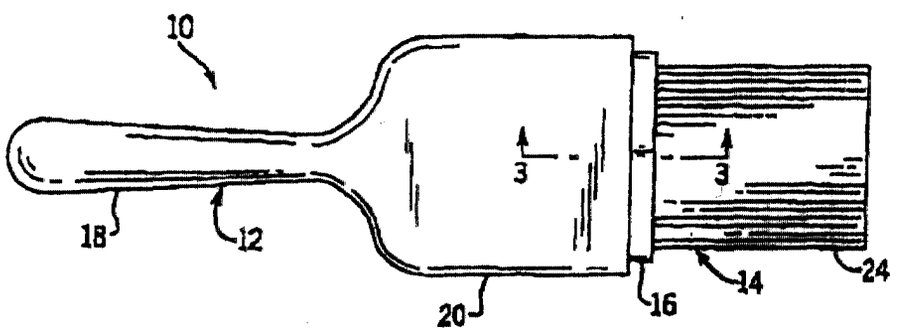
(54) Adjustable ferrule paint brush and methods of manufacture

(57) An adjustable ferrule paint brush and methods of manufacturing an adjustable ferrule paint brush are disclosed. The paint brush utilizes a ferrule which may be separated along at least one separation line in the ferrule to adjust the size of the ferrule for use with a variety of differently sized handles. The method of assembling the adjustable ferrule paint brush includes separating a ferrule along a separation line and coupling the ferrule to a paint brush handle.

FIG. 1



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Description

CROSS-REFERENCE TO RELATED APPLICATION

[0001] This application claims priority under 35 U.S. C. §119 from U.S. Provisional Application No. 60/196,513, filed April 11, 2000, the full disclosure of which, in its entirety, is hereby incorporated by reference.

FIELD OF THE INVENTION

[0002] The present invention relates generally to the field of paint brushes and methods for manufacturing paint brushes.

GENERAL BACKGROUND OF THE INVENTION

[0003] Paint brushes are used to apply paint, varnish, stains and other liquid coatings to surfaces. Conventional paint brushes typically include a handle, a group of bristles and a ferrule securing the group of bristles to the handle. The handle typically includes an elongate narrow diameter gripping portion or shank which widens at a shoulder to form a head. The handle is typically formed from either wood or a rigid plastic. Brush handles formed from rigid plastic are typically injection molded. As conventionally known, injection molding involves filling a cavity that is in the shape of the brush handle with a liquid plastic which is then allowed to solidify before the mold is separated from the finished handle. In some applications, a mold core is positioned inside the mold such that the injected plastic flows within the mold about the core. After the plastic has solidified, the core is removed and the mold is separated to leave a handle having a hollow interior. The resulting cored-out handle has an open axial end.

[0004] The group of bristles typically comprises a plurality of individual brush filaments formed from hair or artificial fibers such as nylon. The filaments are generally interleaved with one or more wedges or spacers. The filaments as well as the spacers are secured to one another and are secured to the ferrule by an epoxy.

[0005] The ferrule typically comprises a thin band of metal partially overlapping the group of bristles and the head of the brush handle, while securing the bristles to the handle. Typically, the ferrule is secured to the group of bristles by the aforementioned epoxy and is secured to the head of the brush handle by staples, rivets or other fasteners extending through the ferrule and into the head or by adhesives between the ferrule and the head.

[0006] Manufacture of such conventional brushes is generally as follows. First, the brush handle is formed as described above. Second, the brush filaments are bunched together and are pulled through the ring formed by the ferrule. Third, the spacers are inserted between the bristle filaments and then the spacers and adjacent bristle filaments are pulled into the ferrule whereby the spacers wedge the axial end of the filaments against the ferrule. Fourth, a relatively thin layer of liquid epoxy is deposited into the ferrule, bonding the bristle filaments and the spacers to the ferrule. Lastly, the ferrule is secured to the head of the brush handle as described above.

[0007] Although most paint brushes are formed by the above described process, the process and the resulting brush have several disadvantages. First, because a uniquely sized and configured mold (and possibly core) is required for each differently sized paint brush handle and paint brush, manufacturing costs are exacerbated, Second, since several different bristle groups must be manufactured to match the various differently sized handles produced, manufacturing processes are inefficient and resources are wasted. Third, since several different handles must be manufactured to match the differently sized bristle groups produced for various applications, manufacturing processes are inefficient and resources are wasted. Fourth, since the conventional methods for securing the ferrule and bristle group to the handle involve the use of staples, rivets or other fasteners, manufacturing and materials costs are further exacerbated.

[0008] As such, there is a need to produce paint brushes having standard dimensions so as to reduce the number of molds and cores required in production. There is a further need to produce a ferrule and bristle group assembly of standard size that may be adapted for use with a number of differently sized handles. There is still further a need to produce paint brush handles that may be used with a number of differently sized bristle groups. There is even further a need for a method of securing a bristle group to a handle while minimizing the amount and cost of required materials.

SUMMARY OF THE INVENTION

[0009] An exemplary embodiment relates to an adjustable ferrule for a paint brush. The adjustable ferrule includes a rigid elongate body portion having a bristle end for attachment to a plurality of bristes and a handle end extending along an axis for coupling with a paint brush handle. The adjustable ferrule also includes at least one separation line in the rigid elongate body portion substantially perpendicular to the axis of the handle end, wherein the separation line divides the rigid elongate body portion into a first body portion and a second body portion.

[0010] Another exemplary embodiment relates to a ferrule/bristle subassembly for a paint brush. The ferrule/bristle subassembly includes a rigid elongate body portion having a bristle end for attachment to a plurality of bristles, a handle end extending along an axis for coupling with a paint brush handle, and a plurality of bristles connected to the bristle end. The ferrule/bristle subassembly also includes at least one separation line in the rigid elongate body portion substantially perpendicular to the axis of the handle end, wherein the separation

line divides the rigid elongate body into a first portion and a second portion.

[0011] Another exemplary embodiment relates to a method for producing a paint brush using an adjustable ferrule. The method includes connecting a plurality of bristles to a ferrule, breaking the ferrule along at least one separation line in the ferrule, and connecting the ferrule to a handle.

[0012] Another exemplary embodiment relates to a paint brush produced by a component adjustment assembly process. The process includes attaching a plurality of bristles to a rigid elongate ferrule, breaking at least one of the rigid elongate ferrule and a paint brush handle along at least one separation line in the rigid elongate ferrule and the paint brush handle, and forming a mechanical interlock between the rigid elongate ferrule and the paint brush handle.

[0013] Other features and advantages of embodiments of the invention will become apparent to those skilled in the art upon review of the following drawings, the detailed description, and the appended claims.

BRIEF DESCRIPTION OF THE DRAWINGS

[0014] FIG. 1 is a top view of a paint brush assembly.

[0015] FIG. 2 is an exploded perspective view of the paint brush assembly illustrated in FIG. 1.

[0016] FIG. 3 is a side sectional view of the paint brush assembly illustrated in FIG. 1 as seen along line 3-3.

[0017] FIG. 4 is an alternative embodiment of the paint brush handle illustrated in FIG. 1 shown in open position.

[0018] FIG. 5 is an exploded top view of a set of paint brushes similar to that illustrated in FIG. 1, showing a size adjustable ferrule.

[0019] FIG. 5A is a top sectional view of an alternative embodiment of the size adjustable ferrule illustrated in FIG. 5 extending between line 4-4.

[0020] FIG. 5B is a top sectional view of an alternative embodiment of the size adjustable ferrule illustrated in FIG. 5 extending between line 4-4.

[0021] FIG. 5C is a top sectional view of an alternative embodiment of the size adjustable ferrule illustrated in FIG. 5 extending between line 4-4.

[0022] FIG. 6 is an exploded top view of a second alternative embodiment of the paint brush illustrated in FIG. 1, showing a stepped adjustable ferrule.

DETAILED DESCRIPTION

[0023] FIGURE 1 is a top elevational view of a paint brush 10, generally including handle 12, bristles 14 and ferrule 16. Bristles 14 comprise a plurality of brush filaments 24 grouped together and interleaved by a plurality of wedges or spacers (not shown). Filaments 24 comprise conventionally known paint brush filaments formed from natural material such as hair or man-made material such as nylon. The spacers are formed from cardboard, felt or plastic. Axial ends of filaments 24 are bound to one another and are bound to the spacers by a conventionally known epoxy (not shown). This epoxy further secures bristles 14 to ferrule 16.

[0024] Ferrule 16 secures bristles 14 to handle 12. As best shown in FIGURE 2, ferrule 16 comprises a rigid elongate body portion of metal or polymer having a bristle end 17 and a handle end 19. When the paint brush is assembled, the bristle end 17 is connected to the bristles 14 and the handle end 19 is connected to the handle 12. Although FIGURE 2 shows a ferrule 16 in which the axis of the handle end 19 and the axis of the bristle end 17 are coaxial, other designs are possible. For example, in an alternative embodiment the ferrule could be bent at a 45 degrae angle such that the handle end 19 has an axis that is coaxial with that of the handle 12 and the bristle end 17 has an axis 45 degrees away from the axis of the handle 12 and handle end 19. Other arrangements are also possible.

[0025] Ferrule 16 may also have surface ribs 15 protruding from the surface of the ferrule 16 for engaging grooves or detents 13 (as best shown in FIGURE 3) in handle 12. The ferrule 16 may be either hollow or solid, depending on the particular application. Alternatively, the ribs 15 may protrude from the inner surface of a hollow ferrule 16 for engaging grooves 13 on the outer surface of a handle 12. Although illustrated as having a generally rectangular shape with rounded sides, the ferrule 16 may be formed in any number of shapes, nonexclusive examples of which include rectangular, ovular, and circular.

[0026] Handle 12 generally includes gripping portion or shank 18 and head 20. Shank 18 comprises an elongate narrow portion of handle 12 configured for being grasped by a user's hand. Head 20 widens from shank 18 and forms a wide surface which provides a surface against which brush 10 may be grasped by a user during painting. Handle 12 supports bristles 14 and ferrule 16.

[0027] FIGURE 2 is an exploded perspective view of paint brush 10, and FIGURE 3 is a side sectional view of paint brush 10 as viewed along line 3-3 in FIGURE 1. Ferrule 16 includes at least one separation line or break line 21. Separation line 21 may be formed according to a variety of methods. The formation of the separation line 21 is discussed in greater detail in relation to FIGURE 5. Separation line 21 is illustrated as a perforation in ferrule 16 which divides ferrule 16 into first portion 22 and second portion 23. The perforation of separation line 21 preferably punches entirely through the ferrule material. Alternatively, the perforation may punch only partially through the ferrule material.

[0028] Separation line 21 facilitates separation of portion 22 and portion 23. Separation of portions 22 and 23 may be accomplished by breaking portion 22 off of the ferrule 16 along separation line 21, leaving only portion 23 of the ferrule. Breaking portion 22 off of the ferrule 16 is preferably accomplished by snapping portion 22 off of the ferrule 16. One possible method of snapping

portion 22 off of the ferrule 16 may be accomplished by grasping portion 22 with one hand and portion 23 with another end flexing the ferrule 16 about the separation line 21 until portions 22 and 23 separate. Alternatively, ferrule 16 may be cut or sheared by a knife blade or other means along separation line 21. Any method of separating portions 22 and 23 along break line 21 should be noted by one skilled in the art as falling within the spirit and scope of the present invention. By separating portions 22 and 23, one may adjust the size of the ferrule 16. Although one separation line is shown in FIGURES 2 and 3, multiple separation lines 21 may be incorporated into the ferrule 16 to allow a user to choose among a plurality of ferrule sizes by separating the ferrule along a particular separation line 21.

[0029] Handle 12 comprises a mouth or opening 11 which receives ferrule 16. Upon insertion of ferrule 16 into handle 12 through opening 11, ribs 15 on ferrule 16 engage or snap into grooves 13 along the inner surface of head 20. When ribs 15 meet grooves 13, a mechanical interlock is formed, securing ferrule 16 to head 20. Thus, at least a portion of ferrule 16 will be contained within cavity 52 when paint brush 10 is assembled. In an exemplary embodiment, ferrule 16 is formed from a polymer or plastic such as polyethylene having a sufficient degree of resilient flexibility to allow ribs 15 and ferrule 16 to flex so as to be inserted through mouth 11 and into the cavity 52 until ribs 15. reach corresponding grooves 13. Alternatively, metals and other materials having sufficient resilient flexibility may be used to form the ferrule 16, Additionally, head 20 may be formed from a material (e.g. polymer, metal, etc.) having sufficient resilient flexibility so as to flex as the ferrule 16 is inserted.

[0030] Although ribs 15 preferably continuously extend along the outer circumferential surface of ferrule 16, ribs 15 may alternatively only partially extend along the outer circumferential surface of ferrule 16. Likewise, although grooves 13 preferably continuously extend along the inner circumferential surface of head 20, grooves 13 may alternatively only partially extend along the inner circumferential surface of head 20. Although ribs 15 engage grooves 13 when paint brush 10 is assembled, ribs 15 and grooves 13 need not have identical inverse patterns. For example, in an alternative embodiment, grooves 13 could continuously extend along the inner circumferential surface of head 20, while ribs 15 might extend only partially along the outer circumferential surface of ferrule 16. In this alternative embodiment, ribs 15 would still engage grooves 13, although portions of the grooves 13 would not be engaged by ribs 15.

[0031] Although three ribs 15 and three grooves 13 are shown in FIGURES 2 and 3, a different number of ribs 15 and grooves 13 may be used. Further, there may be a different number of grooves 13 in head 20 than there are ribs 15 on a given ferrule 16. For example, in an alternative embodiment, a ferrule having three ribs 15 may be used with a head 20 having four or more grooves 13. Not all of the grooves 13 would receive a rib 15 in assembling paint brush 10, although all of the ribs 15 would engage a groove 13.

[0032] The shape and orientation of the ribs 15 and grooves 13 may also differ from those illustrated in the FIGURES. For example, the ribs 15 and grooves 13 need not be oriented perpendicular to the axis of the handle end 19, as illustrated by the FIGURES. For example, the ribs 15 and grooves 13 could be oriented parallel to the axis of the handle end 19. Nor must the ribs 15 and grooves 13 consist of elongated protruding shapes. For example, the ribs 15 and grooves 13 could be circular in shape, such that the ribs 15 resemble raised dots and the grooves 13 resemble dimples. Ribs 15 and grooves 13 of different shapes, sizes, and orientations may be intermixed in the same assembly as well. For example, in an alternative embodiment, a ferrule 16 could have one rib extending continuously along its outer circumferential surface, one circular rib, and one short elongate rib oriented 45 degrees away from the axis of the handle end.

[0033] Thus far the description has contemplated a handle 12 formed from a single piece of material, as for example a handle created by injection molding or other processes designed to form a single piece. Alternatively, FIGURE 4 shows a top elevational view of a clamshell handle design. Handle 12 in this alternative embodiment is formed from a pair of opposing handle clamshell halves 32, 34. Each clamshell half 32, 34 generally forms a shank half 36 and a head half 38. Shank halves 36 and head halves 38 are complementarily shaped so as to mate with one another and form shank 18 and head 20 of paint brush 10 when assembled. Each of halves 32, 34 is preferably injection molded from a rigid polymeric material such as polyethylene. Alternatively other polymeric materials may be used, such as polypropylene, polyvinylchloride, and the like.

[0034] To facilitate a secure coupling of clamshell halves 32, 34 together to form handle 12, each of halves 32, 34 is complementarily shaped with opposing male-female structures. In the exemplary embodiment, clamshell half 32 includes a plurality of female cavities 40 while clamshell half 34 includes a corresponding number of opposite male projections or protuberances 42. Female cavities 40 receive male protuberances 42 to insure proper alignment of clamshell halves 32 and 34 when handle 12 is assembled. Female cavities 40 and male protuberances 42 are preferably configured to resiliently flex when joined together such that clamshell halves 32 and 34 snap together and are retained in their assembled state. In particular, each of female cavities 40 includes a narrowing throat (not shown) which resiliently flexes to receive an enlarged head of male protuberance 42. Although less desirable, clamshell halves 32, 34 may alternatively include other complementary male-female structures aligning halves 32 and 34 when assembled. For example, the perimeter edges of halves 32 and 34 may alternatively include complementary ribs

and channels receiving such ribs. As will be appreciated, the complementary male and female structures on halves 32 and 34 may be intermixed such that a single half contains both male and female structures. Although less desirable, clamshell halves 32, 34 may alternatively include structures which align with one another but which do not provide a snap-fit. Even further less desirable, halves 32, 34 may alternatively omit any such structures whereby other means are provided for securing halves 32 and 34 together such as adhesives, overmolds, welds or fusion bonds.

[0035] As shown by FIGURE 4, halves 32 and 34 each include a peripheral wall 50 that extends about the perimeter of each of halves 32, 34 about an interior cavity 52. As a result, when halves 32, 34 are aligned opposite one another in an assembled state, handle 12 is generally hollow through both shank 18 and head 20. Because handle 12 is hollow, handle 12 requires less material and is lighter in weight. At the same time, handle 12 may be quickly and easily manufactured through simple injection molding equipment not requiring moveable inserts or cores. The peripheral wall 50 does not extend along the bristle end 54 of the handle 12, so as to leave an opening through which ferrule 16 may be inserted when the handle 12 is closed. Alternatively, halves 32, 34 may close about ferrule 16 during assembly. Although not shown in FIGURE 4, the clamshell handle design also may include grooves 13 to receive ribs 15 protruding from ferrule 16 in the same manner as described above. The rib 15 and groove 13 system may be used even where the assembly process involves closing the clamshell halves 32, 34 about the ferrule 16 instead of inserting the ferrule 16 though an opening 11 in the head 20. Alternatively, ferrule 16 may be retained within cavities 52 of head 20 between halves 32, 34 by other means such as being press fit, by means of epoxy or other adhesives, by fusion bonds, or by welds.

[0036] As shown in Figure 4, handle 12 additionally includes a living hinge 56 integrally formed as part of the single unitary body with both halves 32 and 34. Hinge 56 is preferably formed so as to span or bridge opposing side walls 50 of halves 32, 34 on head 20. Hinge 56 is preferably co-injected with halves 32 and 34. Hinge 56 facilitates assembly of halves 32 and 34 by providing and maintaining alignment of halves 32 and 34 at all times, As a result, once formed, halves 32 and 34 may be quickly and easily aligned and joined to one another by simply pivoting one of halves 32, 34 about hinge 56. In the exemplary embodiment, hinge 56 is preferably configured so as to extend into cavity 52 when halves 32 and 34 are assembled such that adjacent walls 50 remain substantially flush with one another to provide handle 12 a smooth outer surface for better gripping and for improved aesthetic appearance. Hinge 56 may alternatively be configured such that hinge 56 remains upon an adjacent and exterior of wall 50, wherein hinge 56 is left intact or is severed once halves 32 and 34 are joined. Alternatively, the handle illustrated in FIGURE 4 may be manufactured as two separate pieces without a living hinge 56.

[0037] FIGURE 5 is an exploded top view of a set of paint brushes 110, 150 similar to that illustrated in FIGURE 1, showing a size adjustable ferrule 122. Paint brushes 110 and 150 include handles 113, 153 and ferrule/bristle subassemblies 115, 155, respectively. Handles 113, 153, portions of which are shown in section for purposes of illustration, are substantially identical to one another and include shank portions 118, 158 and head portions 120, 160, respectively. Shank portions 118, 158 are substantially identical to one another. Head portion 120 has a general length L1 longer than the length L2 of head portion 160.

[0038] Ferrule-bristle subassemblies 115, 155 are identical to one another prior to assembly of paint brushes 110 and 150. In particular, each of subassemblies 115, 155 includes bristle filaments 101 and spacers 102 (not shown) which are positioned within and secured to ferrule 122. Filaments 101 and spacers 102 may be secured to ferrule 122 by epoxy or other means. Ferrule 122 receives bristles 101 and spacers 102 and is configured to be inserted into interior cavity 130 of head portion 120 of brush 110. Ferrule 122 preferably includes outwardly protruding ribs 123 which correspond to grooves 125 formed on an inner surface of head portion 120 of brush 110. During assembly of brush 110, ferrule 122 is inserted into cavity 130 such that ribs 123 project into grooves 125 to mechanically lock ferrule 122 to head portion 120 of brush handle 113. Ribs 123 and grooves 125 may have various shapes, orientations, and configurations, as described above in relation to FIGURES 2 and 3. Additionally, and according to an alternative embodiment, ribs could protrude from the inner surface of head portion 120 and grooves could be formed in the outer surface of the ferrule 122.

[0039] Ferrule 122 also includes at least one separation line 134 preferably extending substantially perpendicular to the axis of the handle end 119 and between ribs 123. Separation line 134 is illustrated as an internal groove which sufficiently penetrates the walls of ferrule 122 so as to allow ferrule 122 to be broken or sheared along separation line 134. The groove creates an area in ferrule 122 where the ferrule material (e.g. metal, polymer) has thickness less. than the area adjacent to the groove so as to allow for easy breakage along the separation line 134. Alternatively, other methods of providing a separation line may be utilized. For example, in an alternative embodiment illustrated in FIGURE 5A, a perforation 144 in ferrule 122 could serve as a separation line. As discussed in relation to FIGURES 2 and 3, although the perforation preferably punches entirely through the ferrule material, in an alternative embodiment the perforation could punch only partially through the ferrule material. In yet another alternative embodiment illustrated in FIGURE 5B, multiple materials 151 and 152 (e.g. different polymers) could be used to form the ferrule 122 so that a weakened area is formed at the

interface 154 between the differing materials; this weakened interface 154 would thus serve as a separation line. In still another alternative embodiment illustrated in FIGURE 5C, localized heating or chemical implant treatments 164 could be used to form weakened areas in the ferrule 122 to serve as separation lines. While these alternative embodiments represent but a few examples of acceptable configurations for forming separation lines in ferrule 122, it should be understood that any method for forming weakened areas in the ferrule which will serve as separation lines falls within the scope and spirit of the present invention. Additionally, while the groove illustrated in FIGURE 5 extends continually about the circumference of the ferrule 122, separation lines may extend only partially about the circumference of the ferrule. Any separation line configuration which allows for separation of the ferrule may be used. The choice of configuration for the separation line may depend on a number of factors, nonexclusive examples of which include material strength and formability.

[0040] Subsequent to breaking ferrule 122 along separation line 134, portion 132 of ferrule 122 may be discarded, leaving portion 133 sized for being completely received within cavity 170 of head portion 160 of brush handle 153. In an alternative embodiment, a portion of the ferrule 133 could protrude from the head portion 160. Although ferrule 122 is illustrated as including a single separation line 134, ferrule 122 may be provided with a plurality of such separation lines enabling ferrule 122 and the bristles 101 it carries to be easily adapted and modified for use with a multitude of different brush handles having differently sized head portions to form a multitude of differently sized paint brushes. Separation line 134 enables differently sized brushes to be quickly and easily manufactured and assembled without requiring a specially sized ferrule for each differently sized brush handle.

[0041] Although FIGURE 5 illustrates an assembly process in which only the length is altered by breaking the ferrule 122 along separation line 134, alternative embodiments allow for altering the width of the ferrule portion which will be received by a paint brush head. For example, in an alternative embodiment illustrated in FIGURE 6, a ferrule 200 includes multiple grooves 201, 202 dividing ferrule 200 into ferrule sections 210, 211, and 212. The ferrule 200 is thus "stepped," such that section 212 is wider than section 211, which in turn is wider than section 210. Depending on the size of the opening 222 in head 221 of handle 220, a different section 210, 211, or 212 would be suited for coupling of ferrule/bristle subassembly 230 and handle 220. Thus, one can increase the width of the portion of the ferrule 200 that will be inserted into a head 221 by breaking the ferrule 200 along one of the grooves 201, 202. Note that although not shown in FIGURE 6, the ferrule 200 and handle 220 include ribs and grooves, respectively. Thus the same assembly method (i.e. forming a mechanical interlock between ferrule 200 and head 221) may be used with the stepped ferrule. A "reverse-stepped" ferrule may also be used. For example, in an alternative embodiment, the ferrule section closest to the bristles 240 could be smaller than the next closest section, and so on, so that the section farthest from the bristles 240 would be the largest. Additionally, although three sections 210, 211, and 212 are shown in FIGURE 6, any number of sections may be used to form stepped ferrule 200. By manufacturing ferrule/bristle subassemblies in this manner, one ferrule/bristle subassembly 230 can be used with a multitude of differently sized handles. By decreasing the different types of ferrule/bristle subassemblies that must be manufactured, manufacturing costs are decreased.

[0042] While the previous discussion has focused on breaking a ferrule along a separation line to change the length and/or width of the ferrule to adapt to a given handle, it should be noted that the same method of forming separation lines may be used to form a paint brush handle. For example, in an alternative embodiment, grooves, perforations, or other separation line systems as described above may be incorporated into a paint brush handle so as to allow portions of the head to be broken off to accommodate different ferrule/bristle subassemblies. In one alternative embodiment, the length of the head portion of the handle could be decreased by removing a portion of the head along a pre-formed separation line. By way of illustration, the grooves in head portion 120 in FIGURE 5 could serve as separation lines in the handle 113 if they were designed to do so. In another alternative embodiment, a head could be formed having a stepped structure as described with regard to the ferrule 200 in FIGURE 6, so as to allow a user to modify the length and width of the head in order to accommodate different ferrule/bristle subassemblies. It should also be noted that both the handle and ferrule may have separation lines. In an alternative embodiment, a component adjustment assembly process could be used wherein during assembly the ferrule, handle, or both could be adjusted by breaking the ferrule, handle, or both along a separation line in the component of the paint brush assembly being adjusted.

[0043] Additionally, although what has thus far been described has focused on a single assembly process wherein the assembly of a paint brush by joining a ferrule/bristle subassembly with a handle constitutes a permanent assembly (i.e. once assembled, the ferrule and handle may not disassembled), temporary assemblies are also within the scope of the present invention, For example, in an alternative embodiment, a paint brush having a clamshell handle assembly as described above could include means for disengaging the clamshell halves so as to allow a user to remove a used ferrule/bristle subassembly and insert a new one. This would allow a user to purchase one handle and discard ferrule/bristle assemblies as the bristles become worn. It would also allow a user to switch between different color paints during painting without having to thoroughly

wash the bristles; instead, the first ferrule/bristle subassembly could be removed and replaced with another. Means for allowing the clamshell halves to disengage from one another could include latching means on the outside of the handle or any other suitable means. In another alternative embodiment, a paint brush assembly using a one-piece molded handle as described above could include means for allowing the removal of the ferrule/bristle subassembly from the handle. An example of such means might include creating grooves and ribs in the paint brush assembly such that when the paint brush is assembled, only slight mechanical interlocking exists between the ribs and grooves. Pulling on the bristle end of the paint brush would thus disengage the ribs from the grooves and allow for removal and replacement of the ferrule/bristle subassembly. Other means for allowing the removal of the ferrule/bristle subassembly may also be used.

[0044] Although the present invention has been described with reference to preferred embodiments, those skilled in the art will recognize that changes may be made in form and detail without departing from the spirit and scope of the invention. For example, although what has been described thus far contemplates the insertion of a ferrule into an opening in a paint brush handle, the insertion of a handle into an opening in a ferrule would serve the same purpose. In such a case, the separation lines discussed above could be part of the handle, allowing one to adjust the size of the handle to fit a given ferrule. The present invention described with reference to the preferred embodiments and set forth in the following claims is manifestly intended to be as broad as possible. For example, unless specifically otherwise noted, the claims reciting a single particular element also encompass a plurality of such particular elements. Additionally, features of various embodiments may be intermixed with those in other embodiments. Furthermore, the above disclosed manufacturing methods may be combined or particular manufacturing steps may be rearranged or replaced by other manufacturing procedures described above to vary the resulting paint brush being formed.

Claims

1. An adjustable ferrule for a paint brush comprising:

a rigid elongate body portion having a bristle end for attachment to a plurality of bristles and a handle end extending along an axis for coupling with a paint brush handle; and
at least one separation line in the rigid elongate body portion substantially perpendicular to the axis of the handle end, wherein the separation line divides the rigid elongate body portion into a first body portion and a second body portion, whereby the separation line facilitates separation of the first body portion and the second body portion to decrease the size of the ferrule.

2. The adjustable ferrule of claim 1, wherein the rigid elongate body portion is a polymer.

3. The adjustable ferrule of claim 1, further comprising at least one rib protruding from the outer surface of the rigid elongate body portion.

4. The adjustable ferrule of claim 3, wherein the rib extends entirely about the outer circumferential surface of the rigid elongate body portion in a direction substantially perpendicular to the axis of the handle end.

5. The adjustable ferrule of claim 3, wherein the rib extends partially along the outer surface of the rigid elongate body portion.

6. The adjustable ferrule of claim 1, wherein the separation line is a region in the rigid elongate body portion having a decreased material thickness as compared to the region in the rigid elongate body portion adjacent to the separation line.

7. The adjustable ferrule of claim 1, wherein the separation line is a perforation in the rigid elongate body portion.

8. The adjustable ferrule of claim 1, wherein the separation line is an interface between different materials in the rigid elongate body portion.

9. The adjustable ferrule of claim 1, wherein the rigid elongate body portion is stepped such that the bristle end has a different size than the handle end.

10. A ferrule/bristle subassembly for a paint brush comprising:

a rigid elongate body portion having a bristle end for attachment to a plurality of bristles and a handle end extending along an axis for coupling with a paint brush handle;
a plurality of bristles connected to the bristle end; and
at least one separation line in the rigid elongate body portion substantially perpendicular to the axis of the handle end, wherein the separation line divides the rigid elongate body into a first portion and a second portion, whereby the separation line facilitates separation of the first portion and the second portion to decrease the size of the ferrule/bristle subassembly.

11. The ferrule/bristle subassembly of claim 10, wherein the rigid elongate body portion is a polymer.

12. The ferrule/bristle subassembly of claim 10, further comprising at least one rib protruding from the outer surface of the rigid elongate body portion.

13. The ferrule/bristle subassembly of claim 12, wherein the rib extends entirely about the outer circumferential surface of the rigid elongate body portion in a direction substantially perpendicular to the axis of the handle end.

14. The ferrule/bristle subassembly of claim 10, wherein the separation line is a region in the rigid elongate body portion having a decreased material thickness as compared to the region in the rigid elongate body portion adjacent to the separation line.

15. The ferrule/bristle subassembly of claim 10, wherein the separation line is a perforation in the rigid elongate body portion.

16. The ferrule/bristle subassembly of claim 10, wherein the separation line is an interface between different materials in the rigid elongate body portion.

17. The ferrule/bristle subassembly of claim 10, wherein the rigid elongate body portion is stepped such that the bristle end has a different size than the handle end.

18. A method for producing a paint brush using an adjustable ferrule, the method comprising:

connecting a plurality of bristles to a ferrule;
breaking the ferrule along at least one separation line in the ferrule; and
connecting the ferrule to a handle.

19. The method of claim 18, wherein connecting the ferrule to a handle comprises inserting at least a portion of the ferrule into an opening in the handle.

20. The method of claim 18, wherein connecting the ferrule to a handle comprises inserting at least a portion of the handle into an opening in the ferrule.

21. The method of claim 18, wherein the ferrule is a polymer.

22. The method of claim 18, wherein the separation line is a region in the ferrule having a decreased material thickness as compared to the region in the ferrule adjacent to the separation line.

23. The method of claim 18, wherein the separation line is a perforation in the ferrule.

24. The method of claim 18, wherein the separation line is an interface between different materials in the ferrule.

25. The method of claim 18, wherein at least one of the ferrule and the handle includes at least one rib and the other of the ferrule and the handle includes at least one groove for receiving the rib.

26. The method of claim 25, wherein connecting the ferrule to the handle comprises causing the rib to engage the groove to create a mechanical interlock.

27. The method of claim 18, wherein the handle comprises a clamshell assembly.

28. A paint brush produced by a component adjustment assembly process, the process comprising:

attaching a plurality of bristles to a rigid elongate ferrule;
breaking at least one of the rigid elongate ferrule and a paint brush handle along at least one separation line in the rigid elongate ferrule and the paint brush handle; and
forming a mechanical interlock between the rigid elongate ferrule and the paint brush handle.

29. The process of claim 28, wherein at least one of the rigid elongate ferrule and the paint brush handle includes at least one protruding rib.

30. The process of claim 28, wherein forming a mechanical interlock includes inserting the rigid elongate ferrule at least partially into an opening in the paint brush handle.

31. The process of claim 28, wherein forming a mechanical interlock includes inserting the paint brush handle at least partially into an opening in the rigid elongate ferrule.

32. The process of claim 28, wherein the separation line is a region having a decreased material thickness as compared to the region adjacent to the separation line.

33. The process of claim 28, wherein the separation line is a perforation.

34. The process of claim 28, wherein the separation line is an interface between different materials.

35. The process of claim 28, wherein the paint brush handle is formed by joining two halves of a clamshell assembly.

FIG. 1

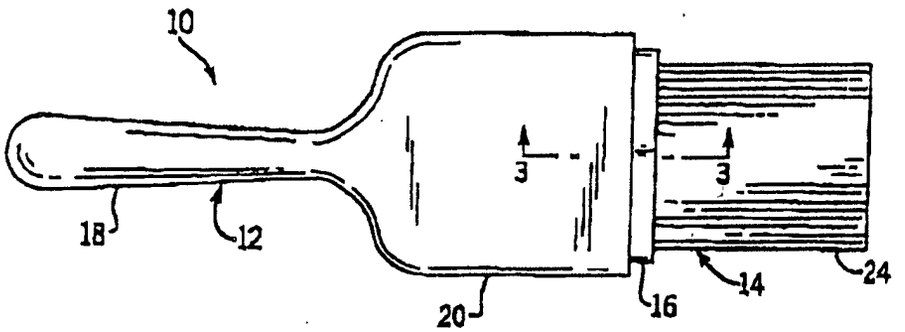
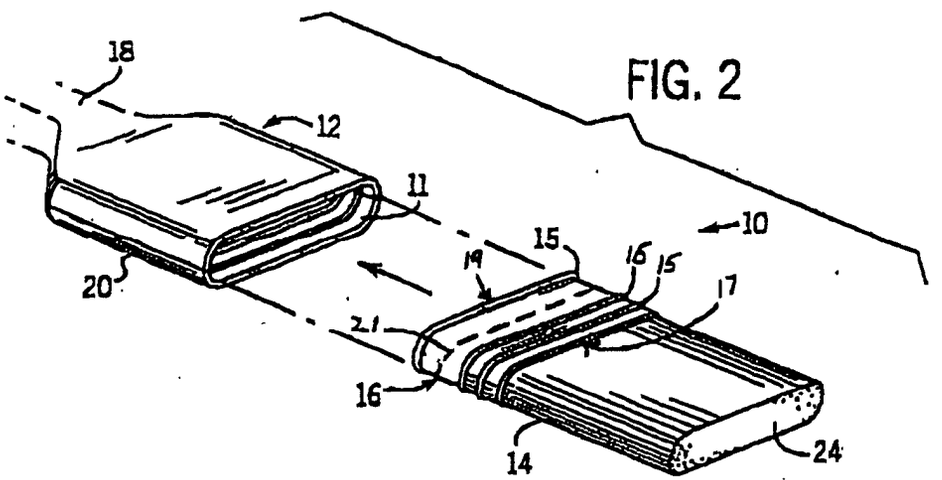


FIG. 2



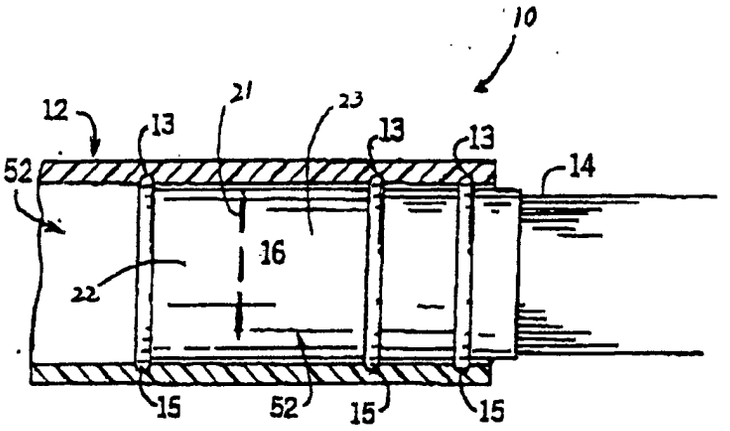

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FIG. 3

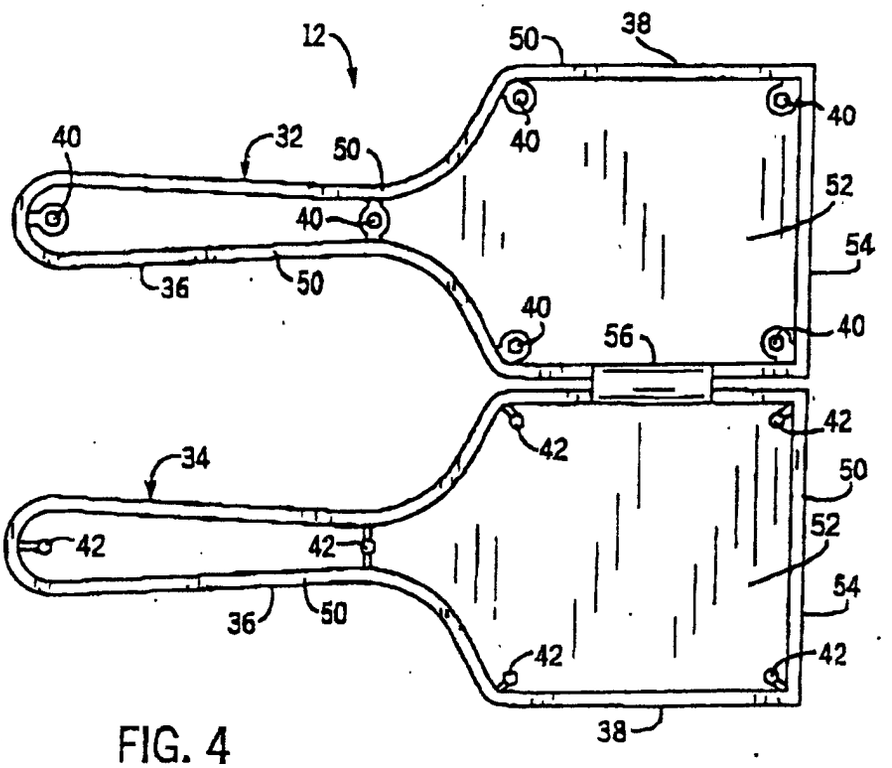
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FIG. 4

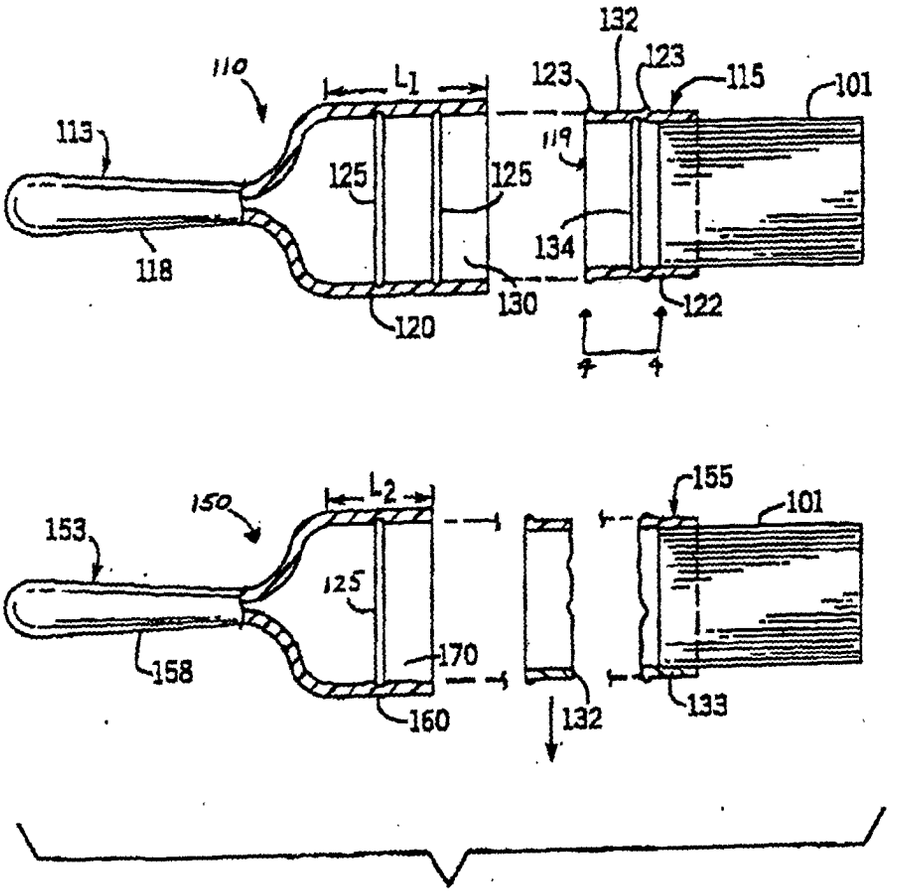
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FIG. 5

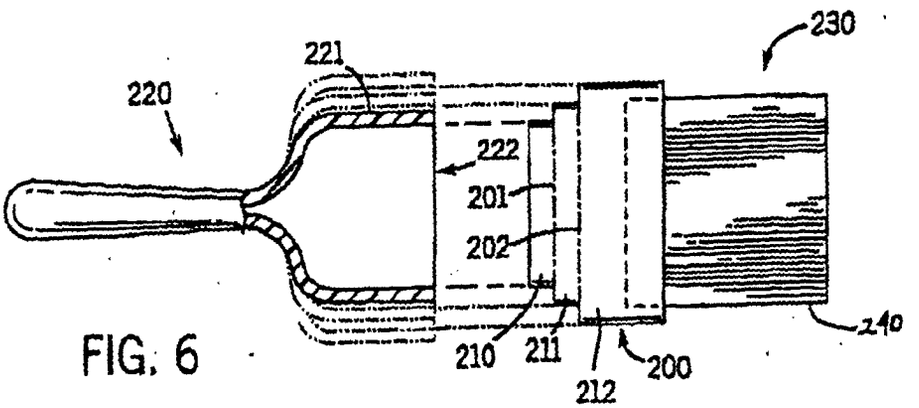
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FIG. 6

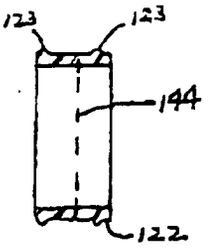

FIG. 5A

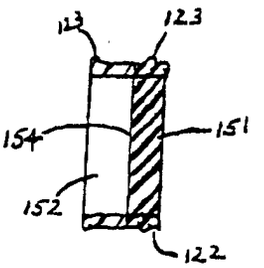

FIG. 5B

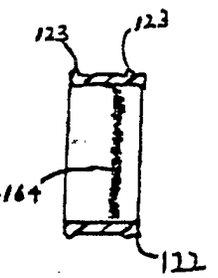

FIG. 5C