March 3, 1970 L. F. KUTIK ETAL 3,497,900

APPLICATOR

Filed June 7, 1967 2 Sheets-Sheet 1

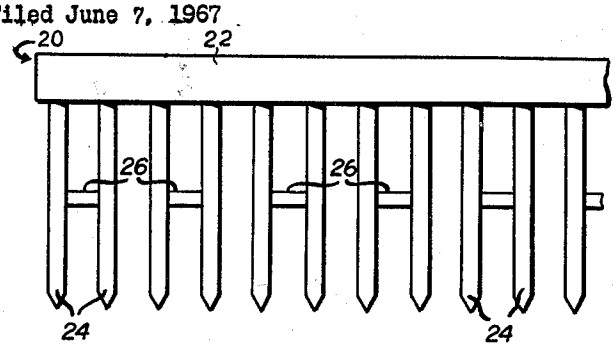


FIG. 1

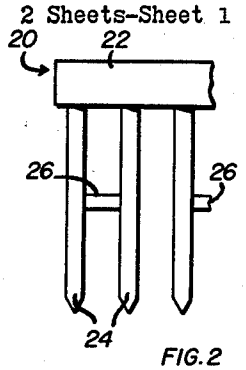


FIG. 2

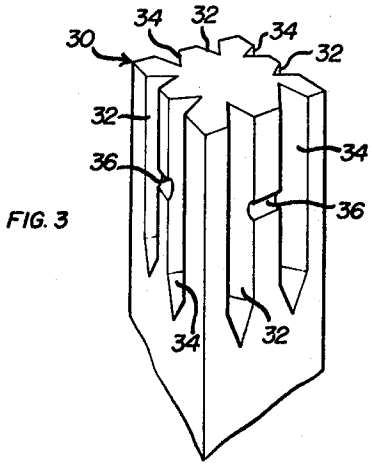


FIG. 3

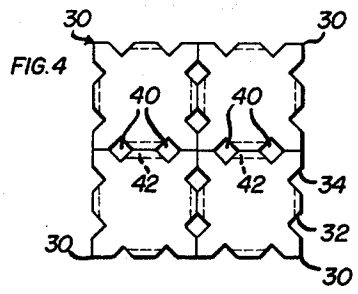


FIG. 4

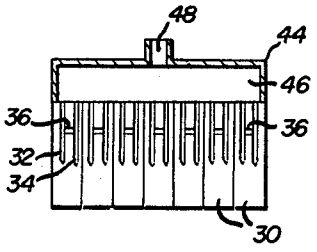


FIG. 5

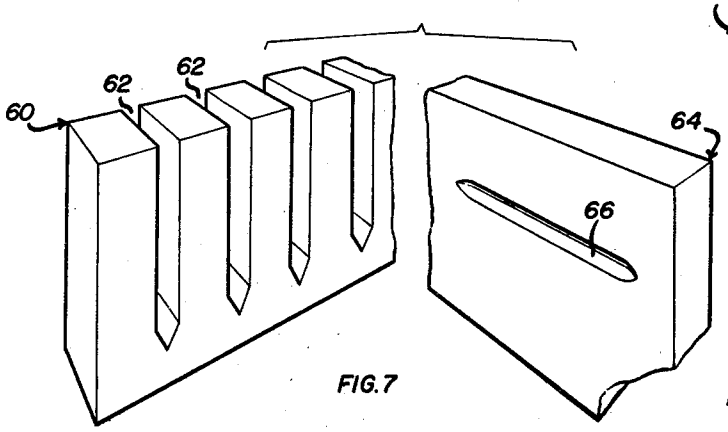


FIG. 7

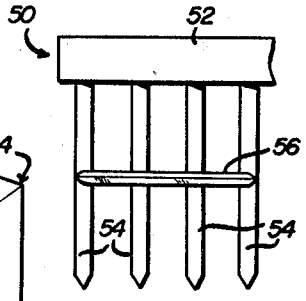


FIG. 6

INVENTORS

ERICH W. GRONEMEYER

LOUIS F. KUTIK

March 3, 1970 L. F. KUTIK ETAL 3,497,900

APPLICATOR

Filed June 7, 1967 2 Sheets-Sheet 2

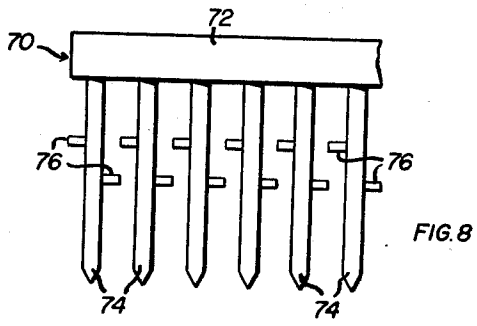


FIG. 8

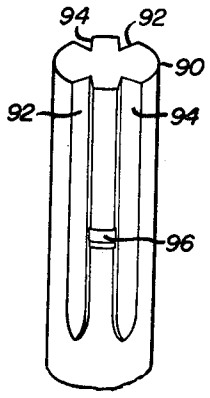


FIG. 10

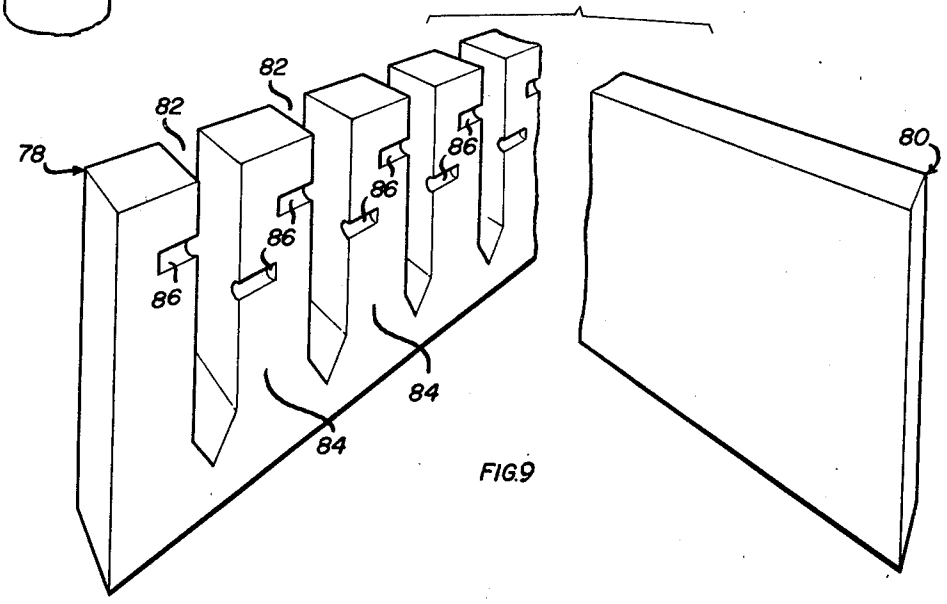


FIG. 9

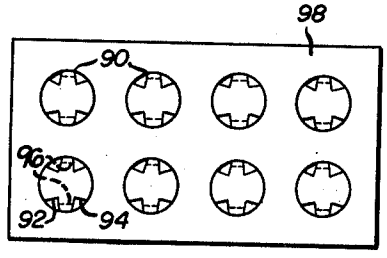


FIG. 11

INVENTORS
ERICH W. GRONEMEYER
LOUIS F. KUTIK

United States Patent Office 3,497,900
Patented Mar. 3, 1970

3,497,900

APPLICATOR

Louis F. Kutik, 5601 SW. 56th St., and Erich W. Gronemeyer, 3430 Galt Ocean Drive, Commodore Apt. 1401, both of Fort Lauderdale, Fla. 33308

Filed June 7, 1967, Ser. No. 644,143
Int. Cl. A46b *11/00*; B08b *1/00*
U.S. Cl. 15—104.93 9 Claims

ABSTRACT OF THE DISCLOSURE

An applicator is provided which may be pre-loaded with material such as soap, paint, cosmetics, medications or the like at the manufacturing stage, and later used to apply the pre-loaded material to an object. The applicator is in the form of a brush having bristles extending from a holder or backing element, and the bristles have protrusions projecting laterally therefrom, which serve to hold flowable material in the brush when such material is applied to the brush. The lateral protrusions may extend between adjacent bristles and join those bristles together, or the protrusions may project laterally from the bristles and terminate in free ends.

BACKGROUND OF THE INVENTION

When flowable material is applied to known brushes, it must ordinarily be promptly applied to an object by brushing since otherwise the material will drain off of the brush. There are no provisions within the ordinary brush for holding flowable material on the brush for a protracted period of time.

SUMMARY OF THE INVENTION

It is now proposed to provide an applicator in the form of a brush which has provisions for holding flowable material in the brush. Thus, the brush may be pre-loaded with flowable material at the time the brush is manufactured, and the brush may be marketed with the flowable material stored in it. The consumer then buys the pre-loaded brush, uses it to apply the pre-loaded material to an object, and then may discard the used brush.

As an example, a brush may be pre-loaded with soap and sold as a disposable item with soap already stored in it. The user brushes his hands with the brush, and soap is applied to the hands from the brush as a result of the brushing action. When the brushing is completed, the used brush may be dicarded if desired. Such a brush is well suited for use by surgeons since the brush may be supplied in a sterile condition and discarded after use to maintain sterile conditions. Alternatively, a shoe brush may be pre-loaded with polish, a paint brush may be pre-loaded with paint, a tooth brush may be pre-loaded with toothpaste, or the like.

Specifically, a brush is provided with elongated bristles which have lateral protrusions extending therefrom, and the protrusions serve to hold flowable material in the brush so that is can be stored therein until the brush is used. The lateral protrusions may extend between and join together adjacent bristles of the brush, or the protrusions may simply project laterally from the bristles and terminate in free ends. In either case, the protrusions block the direct flow of material from the bristles, and the flowable material tends to cling to the protrusions, thus the material will not drain out of the brush as rapidly as would be the case with straight bristles. The brush may find applications wherein the protrusions on the bristles serve merely to retard the drainage of flowable material while the material is being brushed onto an object.

The method of making the brush with lateral protrusions includes steps of injecting plasticized thermoplastic material into a backing-defining mold cavity, injecting plasticized material from the mold cavity into elongated bristle-defining cavities communicating with the mold cavity, and injecting plasticized thermoplastic material from the bristle-defining cavities into lateral extensions of the latter cavities which form protrusions on the bristles. The molds used in carrying out the method have grooves or slots in mold members such as plates or rods, and the grooves or slots form the bristles. The grooves or slots have extensions projecting laterally therefrom which communicates with the main grooves or slots and into which plasticized thermoplastic material is introduced to form the protrusions on the bristles. The extensions may extend, between adjoining grooves or slots to form protrusions which join bristles together, or the extensions may terminate in free ends to form protrusions having free ends. As a final step in the manufacturing of the brush, flowable material may be applied to the bristles as by dipping, and the flowable material is retained in the brush by the protrusions on the bristles. The flowable material is then stored in the brush until it is used, and the brush may be sold with the flowable material already stored in it.

Accordingly, it is an object of the present invention to provide a brush in which flowable material may be pre-loaded, stored and later applied to an object by brushing.

Another object of the invention is to provide a brush with means for holding flowable material on bristles of the brush.

Another object of the invention is to provide a brush with bristles having lateral protrusions thereon for holding flowable material in the brush, the protrusions either joining adjacent bristles together, or simply projecting from bristles and terminating in free ends.

Other objects of this invention will appear in the following description and appended claims reference being had to the accompanying drawings forming a part of this specification wherein like reference characters designate corresponding parts in the several views.

On the drawings:

FIGURE 1 is a fragmentary elevational view of a brush having bristles with protrusions thereon in accordance with one embodiment of the invention;

FIGURE 2 is a fragmentary elevational view of the end of the brush of FIGURE 1;

FIGURE 3 is a perspective view of a portion of a grooved pin or rod which may be used to form mold cavities in the molding of the brush of FIGURES 1 and 2;

FIGURE 4 is a top plan view showing 4 of the pins or rods of FIGURE 3 grouped together so as to form bristle-defining cavities with extensions between the cavities;

FIGURE 5 is a schematic view showing a group of pins or rods with a backing-forming mold at the top thereof;

FIGURE 6 is a fragmentary elevational view of a brush having a group of four bristles all joined together by a single lateral member;

FIGURE 7 is a perspective view of two mold members in the form of plates which may be used to mold the brush of FIGURE 6;

FIGURE 8 is a fragmentary elevational view of a brush having bristles with protrusions thereon which terminate in free ends;

FIGURE 9 is a perspective view showing portions of molding plates which may be used to mold the brush of FIGURE 8;

FIGURE 10 is a perspective view of a round pin having

longitudinal grooves therein joined by a lateral groove for forming bristles joined together by a lateral protrusion; and

FIGURE 11 is a plan view showing several of the pins of FIGURE 9 inserted into holes in a plate for forming bristle-defining cavities.

Before explaining the present invention in detail, it is to be understood that the invention is not limited in its application to the details of construction and arrangement of parts illustrated in the accompanying drawings, since the invention is capable of other embodiments and of being practiced or carried out in various ways. Also, it is to be understood that the phraseology or terminology employed herein is for the purpose of description and not of limitation.

As shown on the drawings:

Referring first to FIGURES 1 and 2, there is shown enlarged and not to scale a portion of a brush **20** having a plastic backing member **22** and a plurality of plastic bristles **24** formed integrally with the backing member **22** and projecting perpendicularly from the backing member in parallel relation with each other. It may be seen the bristles **24** have protrusions in the form of strips **26** extending between and joining together adjacent bristles, and these strips **26** are spaced a substantial distance away from the tips of the bristles **24**. The strips **26** may be molded along with the bristles and are preferably integral with the bristles of the brush.

It may be seen from FIGURES 1 and 2 that if the brush **20** is dipped into a liquid, the protrusions or strips **26** will tend to hold at least some of the liquid material up in the brush, and the liquid will not drain out of the brush as efficiently or as rapidly as if the protrusions **26** were not present. Thus, a material such as soap, paint, cosemetics, or medications may be pre-loaded in the brush **20**, and the brush may be packaged in a suitable manner to protect the material pre-loaded in the brush. The brush may then be marketed through normal distribution channels, and the ultimate user may simply remove the brush from the packaging and apply the pre-loaded material to an object by brushing the object with the brush **20**. After the brushing is completed, the brush may be discarded if desired.

The utility of the brush **20** is not limited to the preloading of flowable material as just described. The brush may be marketed without pre-loaded material in it, and in this case it is simply dipped into the liquid to be applied to an object at the time of use. The protrusions or strips **26** will retard the drainage of liquid material off of the bristles of the brush such that the material will be applied more gradually to the object than if the protrusions **26** were not present. By blocking the draining of liquid, a greater amount of liquid is retained in the brush and the liquid applying efficiency of the brush is enhanced.

FIGURES 3, 4 and 5 illustrate molding pins and a method of molding using the pins so as to mold the brush **20** of FIGURES 1 and 2. A method of molding using pins of the type shown in FIGURES 3 through 5 is described and claimed in a copending application of the present inventors, Ser. No. 616,670, filed on Feb. 16, 1967, and reference is made to that application for details of the general molding method. The molding method of the present application is an improvement over the general method and is adapted to provide protrusions **26** on the bristles of a brush.

In FIGURE 3 is a pin **30** which is square in cross-section, and which has two grooves **32** and **34** on each face of the pin and extending longitudinally of the pin as shown. There is a groove extension **36** extending laterally between each pair of grooves **32** and **34**, and the purpose of this groove extension **36** is to form the protrusions **26** of the brush **20**. The groove extensions **36** should preferably be shallow and have a curved configuration as shown in FIGURE 3 to facilitate removal of the bristles and protrusions from the grooves and groove extensions.

FIGURE 4 shows four of the pins **30** grouped together so as to form bristle-defining cavities with protrusion-forming cavities extending between the bristle-forming cavities. It may be seen that the grooves **32**, **34** and **36** in adjacent ones of the pins **30** match up to form bristle-defining cavities **40** with protrusion-defining extensions **42** joining and communicating with the cavities **40**. The pins **30** are held together by suitable clamping or cam means during molding so that the cavities **40** and **42** are sealed, and the pin members **30** are separated slightly after the molding is completed to facilitate removal of the bristles **24** and protrusion **26** from the cavities **40** and **42**. Suitable provisions for clamping and unclamping the members **30** are described in the copending application referred to previously.

Referring to FIGURE 5, it may be seen that a hollow mold member **44** is placed over the top ends of the pins **30** to form a backing-defining cavity **46**. In molding the brush, plasticized thermoplastic material is introduced into the backing-defining cavity **46** through an opening **48**, and the plasticized thermoplastic material is supplied from cavity **46** into the bristle-defining cavities **40** formed by the grooves **32** and **34** and from there into the protrusion-defining cavities **40** formed by grooves **36**. After molding, the mold member **44** is removed from pins **30**, and the pins **30** are separated slightly to facilitate removal of the brush. The brush with the backing **22**, bristles **24** and protrusions **26** all molded integrally with each other is removed from the pins **30**.

After the brush is removed from the mold members, it may be dipped into a liquid material as described above in order to pre-load the brush with flowable material. The brush has been found to be particularly advantageous when pre-loaded with soap, since one can then scrub the hands with the pre-loaded soap by brushing, and the brush can be discarded after use. Surgeons may find this technique of scrubbing particularly useful since the brush and soap may be kept sterile before use, and the brush may be discarded after use to main sterile conditions.

FIGURE 6 illustrates a portion of a brush **50** which forms another embodiment of the invention. The brush **50** has a backing element **52** and bristles **54** projecting perpendicularly from the backing element **52** and parallel to each other. There is a protrusion or strip **56** which joins all four of the bristles **54** together. The backing element **52**, the bristles **54** and the protrusion or strip **56** are preferably all formed integrally together of the same plastic material. The strip **56** is spaced a substantial distance from the tips of the bristles **54**, and it may be noted that strip **56** is on the outside of the bristles and projects into the space between rows of bristles. The strip **56** serves to hold flowable material in the brush **50** in the manner and for the purposes described above.

FIGURE 7 illustrates two plate-like mold members which may be used in molding of the brush **50** of FIGURE 6. A general method of molding utilizing such plate members is described in U.S. Patents 3,214,777 to Louis Kutik, and reference is made to that patent for details of the general molding method using plates. It may be seen in FIGURE 7 that one plate **60** is provided with a plurality of grooves in the form of slots **62** which are cut all the way through the thickness of the plate and extend vertically in the plate substantial distance. When two plates like the plate **64**, which has no slots, are placed on opposite sides of plate **60**, the slots **62** in plate **60** form bristle-defining cavities. It may be seen that a groove **66** is cut in one face of the plate **64**, and this groove serves to interconnect all of the slots **62** in plate **60**. The bristles **54** of brush **50** are formed in the slots **62** of plate **60**, and the strip **56** which interconnects the bristles **54** is formed in the groove **66** in plate **64**.

To form a complete brush, a plurality of slotted plates **60** are placed alternately between un-slotted plates **64**

having grooves **66** therein to form bristle-defining cavities at the slots **62**, and protrusion-defining extensions defined by the grooves **66**. A mold member similar to the mold member **44** of FIGURE 5 is placed over the top of the plates **62** and **64** to form a backing-defining cavity. Plasticized thermoplastic material is injected into the backing-defining cavity and is injected from there to the bristle-defining cavities formed by the slots **62**. The plasticized material is injected from the slots **62** into the lateral grooves **66** to fill the protrusion-defining cavities. The plasticized material is allowed to solidify, and the plates are then separated slightly to allow the complete brush to be withdrawn from the plates.

FIGURE 8 shows a portion of a brush **70** which forms another embodiment of the invention. The brush **70** includes a backing member **72** and a plurality of bristles **74** projecting perpendicularly from the backing element **72** and parallel with each other. The bristles **74** have protrusions **76** thereon which project laterally from the bristles **74** and terminate in free ends. This illustrates that it is not essential to have the protrusions interconnect the joining bristles, but rather they may simply project from the bristles and terminate in free ends as shown. The protrusions **76** may all be provided at the same distance from the tips of the bristles **74**, or they may be staggered along the bristles in a manner shown in FIGURE 8. Similarly, the protrusions or strips **26** in FIGURE 1 and **56** in FIGURE 6 may be provided at different distances from the tips of the bristles. The protrusions **76** serves to hold flowable material in the brush **70** in the same manner as has been described above.

Referring to FIGURE 9, there is shown a pair of plates **78** and **80** which may be used for molding the brush **70**. Plate **78** is very similar to plate **60** of FIGURE 7 and has a plurality of grooves in the form of slots **82** spaced along the length thereof and extending vertically a substantial distance. The slots **82** are cut all the way through the thickness of the plate **78**, and it will be apparent that when two blank plates like the plate **80** are placed on opposite sides of plate **78**, the slots **82** form bristle-defining cavities. There are no slots or grooves cut in the plate **80**, and the latter plates are simply blanks for forming boundary walls of the bristle-defining cavities. Cut into the sides of the plate portions **84** between the slots **82** are protrusion-defining recesses **86**. One such recess has been provided on each slot of each plate portion **84** such that protrusions formed in the recesses **86** will project from both sides of each bristle **74** in the manner shown in FIGURE 8. The recesses **86** are open on one side of the plate **78**, and this open side is closed by the blank plate member **80** when it is placed next to the slotted plate **78**.

In molding a brush using the plates **78** and **80** of FIGURE 9, a group of the plates are assembled together with the slotted plates **78** alternating with the blank plates **80**. A backing-defining mold member similar to the mold member **44** of FIGURE 5 is placed on the top side of the assembly of plates, and this mold member serves to fom the backing **72** of the brush **70**. Plasticized thermoplastic material is introduced into the backing-defining mold cavity and is supplied from there into the bristle-defining cavities formed by the slots **82**. The plasticized material enters the recesses **86** and forms the protrusions **76** therein. After the plasticized material has solidified, the backing-defining mold member is removed, the plates are separated, and the brush is removed from the plates. The bristles of the brush may be moved laterally with respect to the mold member **18** to spring the protrusions **76** loose from the recess of **86**, and the brush may then be withdrawn from the plates.

FIGURES 10 and 11 show still another way of molding bristles with protrusions formed thereon, and in this case the bristles are molded using round pins **90**. The pin **90** in FIGURE 10 has two pairs of grooves **92** and **94** extending lengthwise thereof parallel to each other, and there

is a protrusion-defining groove **96** extending between grooves **92** and **94**. The grooves **92** and **94** form cavities in which the bristles of a brush are molded, and the groove **96** forms a protrusion which joins two adjoining bristles together.

FIGURE 11 shows several of the pins **90** inserted into holes in a plate **98** so that the groove **92** and **94** form bristle-defining cavities. The grooves **96** are shown by dashed lines in FIGURE 10, and it will be understood that they interconnect bristle-defining cavities **92** and **94**. Molding is accomplished in the same manner as has been described in connection with the other figures. That is, a mold member for forming a backing is placed on top of the plate **78** in the manner shown in FIGURE 5. Plasticized thermoplastic material is introduced into the backing-defining cavity and flows from there into the bristle-defining cavities and into the groove **96** extending between each pair of cavities **92** and **94**. When the plasticized material has solidified, the backing-defining mold is removed from the plate **98**, and the pins **90** are also removed from the plate **98**. The brush may then be separated from the pins **90**.

It is apparent from the foregoing description that the invention provides an applicator in the form of a brush which has provisions for holding flowable material in the brush. The brush may be pre-loaded with flowable material, and the flowable material will stay in the brush until it is used at a substantially later time. Alternatively, flowable material may be applied to the brush at the time of use thereof, and the provisions for holding flowable material in the brush serve to retard the flow of material out of the brush to provide a gradual or more effiecient application of material from the brush. The holding action is achieved by providing protrusions on the bristles of the brush, and these protrusions may be in the form of joints between bristles or simply protrusions on the bristles which terminate in free ends. The protrusions are spaced a substantial distance from the tips of the brush to keep material well up into the brush. The bristles with protrusions thereon may be molded from plastic material integrally with a backing element by any of the methods described above, and mold members are provided which have protrusion-forming cavities associated with the bristle-defining cavities thereof as has been described.

Having thus described our invention, we claim:

1. In a bristled product having a backing element and a plurality of individual bristles integral with and projecting from said backing element substantially perpendicular thereto and terminating in free ends, the improvement comprising a plurality of protrusions projecting laterally substantially at right angles from at least some of said bristles and integral therewith, said protrusions being spaced substantially from said free ends of said bristles and serving to retain flowable material on said bristles intermediate said protrusions and said backing element, said backing element and said bristles and said protrusions all being molded as one piece.

2. The brush as claimed in claim **1** in which at least some of said protrusions extend between and join together adjacent bristles of said brush.

3. The brush as claimed in claim **1** in which at least some of said protrusions project laterally from the respective bristles and terminate in a free end.

4. An applicator comprising a brush consisting of a bristle holder and a plurality of bristles projecting from said holder substantially parallel to each other and terminating in free ends, a plurality of protrusions projecting laterally at substantially right angles from at least some of said bristles, and a liquid material retained by said protrusions in said brush in a condition to be applied to an object by brushing the object with said brush, said bristle holder, said bristles and said protrusions all being formed integrally as one piece.

5. An applicator comprising a backing of plastic mate-

rial, a plurality of plastic bristles integral at one end thereof with said plastic backing and projecting from said backing substantially perpendicular thereto and terminating in a free end, plastic protrusions projecting laterally at substantially right angles from at least some of said bristles and integral therewith, said protrusions being spaced substantially from the free ends of said bristles, and a flowable material retained intermediate said protrusions and said backing in said applicator in a condition to be applied to an object by brushng the object with said applicator, said backing, said bristles, and said protrusions being molded integrally as one piece.

6. The applicator as claimed in claim 5 in which at least some of said protrusions extend between and join together adjacent bristles of said applicator.

7. The applicator as claimed in claim 5 in which at least some of said protrusions project laterally from the respective bristles and terminate in a free end.

8. In a bristled product having a backing element and a plurality of individual bristles projecting from said backing element substantially perpendicular thereto and terminating in free ends, the improvement comprising a plurality of protrusions projecting laterally at least from some of said bristles and integral therewith, said protrusions extending between and joining together adjacent bristles of said product, and said protrusions being spaced substantially from said free ends of said bristles and serving to retain flowable material on said bristles.

9. An applicator comprising a backing of plastic material, a plurality of plastic bristles integral at one end thereof with said plastic backing and projecting from said backing substantially perpendicular thereto and terminating in a free end, plastic protrusions projecting laterally from at least some of said bristles and integral therewith, said protrusions extending between and joining together adjacent bristles of said applicator, and said protrusions being spaced substantially from the free ends of said bristles, and a flowable material retained intermediate said protrusions and said backing in said applicator in a condition to be appled to an object by brushing the object with said applicator.

References Cited

UNITED STATES PATENTS

564,497	7/1896	Babis	15—104.9
2,524,942	10/1950	Tomlinson.	
2,649,959	8/1953	Hallahan.	
3,090,061	5/1963	Charvat	15—159
3,411,979	11/1968	Lewis.	

FOREIGN PATENTS

958,327	9/1949	France.
950,461	10/1956	Germany.
1,140,901	12/1962	Germany.
306,337	3/1933	Italy.

PETER FELDMAN, Primary Examiner

U.S. Cl. X.R.

15—159, 187; 264—243