Oct. 9, 1962 H. C. DAVIS 3,057,044

ROLLER CONSTRUCTION

Filed Aug. 21, 1958

Fig. 1

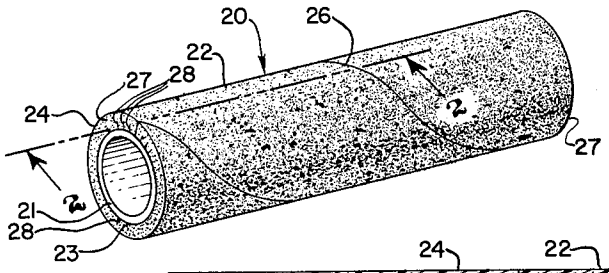


Fig. 2

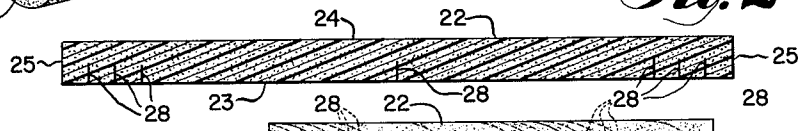


Fig. 3

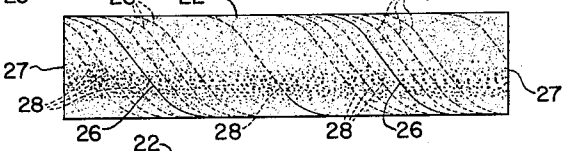


Fig. 4

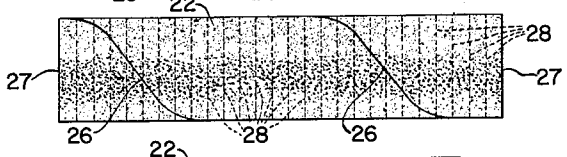


Fig. 5

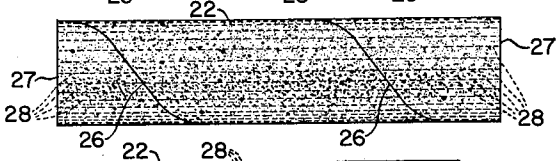


Fig. 6

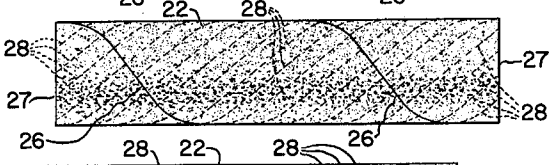


Fig. 7

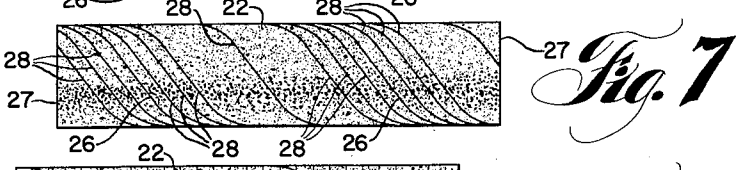


Fig. 8

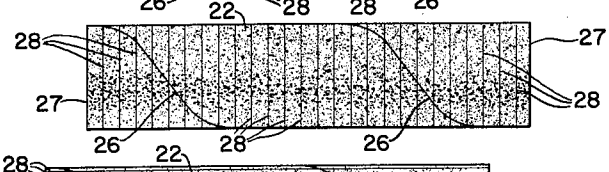


Fig. 9

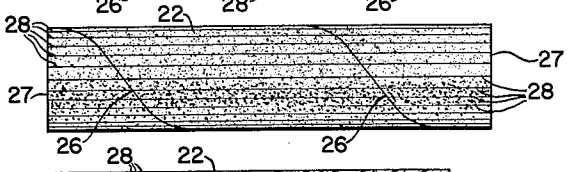
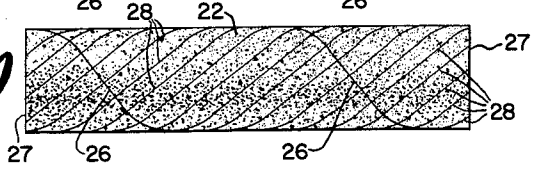


Fig. 10



INVENTOR.
HOWARD C. DAVIS
BY Gray, Mase & Dunson
ATTORNEYS

United States Patent Office 3,057,044 Patented Oct. 9, 1962

3,057,044

ROLLER CONSTRUCTION

Howard C. Davis, Columbus, Ohio, assignor, by mesne assignments, to The Wooster Brush Company, Wooster, Ohio, a corporation of Ohio

Filed Aug. 21, 1958, Ser. No. 756,393
3 Claims. (Cl. 29—121)

This invention relates to improvements in a roller construction for painting and similar operations. More particularly, it relates to a new and improved construction of rollers having a cover comprising a layer of resilient, porous material to roll paint on walls, ceilings, or other types of surfaces.

These rollers are well known to the art. The invention herein, however, relates only to the roller portion of the paint applicator and not to the entire applicator. The roller consists of a cylindrical support made from a rigid material, such as cardboard or metal. The cylindrical support is rotatably mounted from the inside of the cylinder in a manner that permits the roller to spread paint held in its cover from its outside surface onto a flat surface by a rolling movement. The cylindrical support is covered externally, with the exception of the ends which remain open, with a clothlike material or with a fibrous structure, such as a sponge. A resilient material, such as polyurethane foam which is a soft, porous, spongelike substance manufactured by conventional means and which may be obtained in various shapes such as blocks or flat sheets, has been found to be an excellent covering for paint rollers, in that, after dipping it into the paint, it retains a considerable amount of paint for application to the surface to be painted. It applies paint very smoothly and is relatively inexpensive as compared with other materials that have been used in the past. A seamless roller cover of resilient material could be made by cutting a cylinder out of a solid block of such material, and then coring out the center. Since this would result in substantial waste, due to loss of the core and other useless fragments, roller covers made of flat sheets of resilient material of proper thickness and wound onto a cylindrical support are more economically manufactured. After the cover material is wound onto the cylinder, it is held in place by a suitable adhesive, such as a waterproof glue. The amount of paint held in a cover material such as polyurethane foam is partly dependent upon the thickness of the material. Where the thickness of the material is greater than 3/16 inch, a roller having a resilient, porous cover wound onto the cylinder without embodying the principles of the invention to be described exhibits a ragged or humped side. In a roller construction having the resilient cover material helically wound over the cylindrical support, the hump at the side prevails along the spirally disposed seam on the outside surface of the roller. This result is caused by the winding of the resilient cover around the sharp bend of the cylindrical support. The outside of the cover is stretched, while the inside of the cover is being compressed. The reaction along the inner surface is a tendency to push material toward the sides and the reaction along the outer surface is to pull toward the center or away from the sides, causing a raised section or bump along the sides. The stretching of the outer surface and the compression of the inside of the resilient cover become greater as the thickness of the cover material is increased.

A principal feature of the invention is the provision of slits partly through the thickness of the resilient layer, which break up the continuity of the material and provide relief for the expanding and contracting forces described above, thereby making it possible to manufacture

roller covers from relatively inexpensive flat strips of material and obtain smooth, even external surfaces even on thick covers.

Other advantages of the invention are apparent from the following specification, the drawings relating thereto, and the claims herein set forth.

In the drawings:

FIG. 1 is a perspective view of the assembled roller;

FIG. 2 is a cross-sectional view of the roller cover, taken substantially along the line 2—2 of FIG. 1;

FIG. 3 is an elevational view of the roller cover, with slits on the inside surface and parallel to the helix formed by the sides of the cover material;

FIG. 4 is an elevational view of the roller cover, with slits on the inside surface and parallel to the ends of the roller cover;

FIG. 5 is an elevational view of the roller cover, with slits on the inside surface and parallel to the axis of the roller cover;

FIG. 6 is an elevational view of the roller cover with slits on the inside surface and perpendicular to the helix formed by the sides of the roller cover;

FIG. 7 is an elevational view of the roller cover with slits on the outside surface and parallel to the helix formed by the sides of the cover material;

FIG. 8 is an elevational view of the roller cover with slits on the outside surface and parallel to the ends of the roller cover;

FIG. 9 is an elevational view of the roller cover with slits on the outside surface and parallel to the axis of the roller cover; and

FIG. 10 is an elevational view of the roller cover with slits on the outside surface and perpendicular to the helix formed by the sides of the cover material.

Referring to FIGS. 1 and 2, a roller, generally indicated as 20, is provided with a cylindrical support 21 and a resilient cover 22. The resilient cover 22 has an inside surface 23, an outside surface 24, and sides 25—25. The cover 22 is wound around the cylindrical support 21, so that the sides 25 of the cover 22 form a helical seam 26. The cylinder formed by the roller has the plane of its extremities at right angles to the axis forming the ends 27 of the cover. Partial separations or slits 28 extend from one surface of the cover for a substantial depth toward the opposite surface, but never entirely through the thickness of the cover material and may be oriented with respect to the roller cover, in various directions.

Referring to FIG. 3, a resilient cover 22 is wound into cylindrical form in such a manner that there is a helical seam 26, with slits 28 on the inside surface 23, which are disposed parallel to the helical seam 26.

In FIG. 4, a resilient cover 22 is wound into cylindrical form in such a manner that there is a helical seam 26 with slits 28 on the inside surface 23 which are disposed parallel to the ends 27.

Referring to FIG. 5, a resilient cover 22 is wound into cylindrical form in such a manner that there is a helical seam 26 with slits 28 on the inside surface 23, which are disposed parallel to the axis of the cylinder.

Referring to FIG. 6, a resilient cover 22 is wound into cylindrical form in such a manner that there is a helical seam 26, with slits 28 on the inside of the surface 23, which are disposed perpendicular to the helical seam 26.

Referring to FIG. 7, a resilient cover 22 is wound into cylindrical form in such a manner that there is a helical seam 26 with slits 28 on the outside surface 24, which are disposed parallel to the helical seam 26.

Referring to FIG. 8, resilient cover 22 is wound into cylindrical form in such a manner that there is a helical

seam **26**, with slits **28** on the outside surface **24**, which are disposed parallel to the ends **27**.

Referring to FIG. 9, a resilient cover **22** is wound in cylindrical form in such a manner that there is a helical seam **26** with slits **28** on the outside surface **24**, which are disposed parallel to the axis of the cylinder.

In FIG. 10, a resilient cover **22** is wound into cylindrical form in such a manner that there is a helical seam **26** with slits **28** on the outside surface **24**, which are disposed perpendicularly to the helical seam **26**.

The slits which have been described serve to allow space for expansion or contraction, and in this manner relieve the tension along the surface, brought about by winding the cover around the cylindrical support. The resulting appearance is a smooth, neat roller, without loose or bumpy seams. The possibilities of excess paint collecting in spaces beneath the cover, lines on the painted surface, or a loose-looking cover are eliminated. While it is not believed to be critical it has been found that slits in one surface of the material extending for a substantial depth toward the opposite surface accomplish the purpose without destroying the strength and uniformity of the cover. The slits are shown as parallel in the embodiments of the invention presented, as a matter of convenience, but whatever manufacturing process is most convenient in producing the slits to give satisfactory results may be used. While not believed to be limited by any particular disposition of slits, a number of ways of disposing the slits is shown, but as long as the tension of the helically wound cover is reduced, satisfactory results are obtained. For example, many different embodiments are shown, indicating that whatever process is used to put slits in the cover will achieve satisfactory results. While the slits might be arranged in any direction, the most convenient is the arrangement in the embodiment of FIG. 3, with the slits parallel to the helix. For a strip of foam about 3/16 to 3/8 inch thick and a few inches wide, about seven slits arranged as shown in FIGS. 2 and 3 are sufficient, although more can be used if desired. The slits can be provided at virtually no cost by putting additional rotary saw blades on the same shaft with the two larger blades used to cut the foam pads into strips. The slits can be provided in other ways, however, and it is not necessary that any of the foam be removed. If the slits are made in such a way, as by knives, so that no material is removed, the effect is substantially the same, since the glue on the supporting form confines the compressed underside of each narrow strip between slits.

While there have been illustrated and described the present embodiments of the rollar in more or less detail, it is realized that various modifications of the invention may be made without departing from the spirit and scope thereof and without the exercise of further invention. No attempt is here made to exhaust all such possibilities. It will be understood that the words used herein are words of description rather than of limitation, and that various changes may be made without departing from the spirit or scope of the invention herein disclosed.

What is claimed is:

1. In a roller for painting and similar operations, a cylindrical support, and a one-piece, flat-sheet cover of flexible spongelike material helically wound over and attached to the outer cylindrical surface of said support, said layer of flexible material having a plurality of unconnected slits extending from one surface thereof for a substantial depth toward the opposite surface, the slits being closed at the surface from which they extend so that said surface is of uniform nature.

2. In a roller for painting and similar operations, a cylindrical support, and a one-piece, flat-sheet cover of flexible spongelike material helically wound over and attached to the outer cylindrical surface of said support, said layer of flexible material having a plurality of unconnected slits extending from the outer surface thereof for a substantial depth toward the inner surface, the slits being closed at said outer surface so that said surface is of uniform nature.

3. In a roller for painting and similar operations, a cylindrical support, and a one-piece, flat-sheet cover of flexible spongelike material helically wound over and attached to the outer cylindrical surface of said support, said layer of flexible material having a plurality of unconnected slits extending from the inner surface thereof for a substantial depth toward the outer surface, the slits being closed at said inner surface so that said surface is of uniform nature.

References Cited in the file of this patent

UNITED STATES PATENTS

1,100,090	Parker	June 16, 1914
1,618,704	Grupe	Feb. 22, 1927
2,005,885	Brindley	June 25, 1935
2,501,780	Lowe	Mar. 28, 1950
2,656,582	Freedlander	Oct. 27, 1953
2,753,577	Van Clief	July 10, 1956