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H. CAVE

2,653,340

BRUSH WITH ELEMENT OF THE CHANNEL STRIP TYPE

Filed March 10, 1948

Fig. 1.

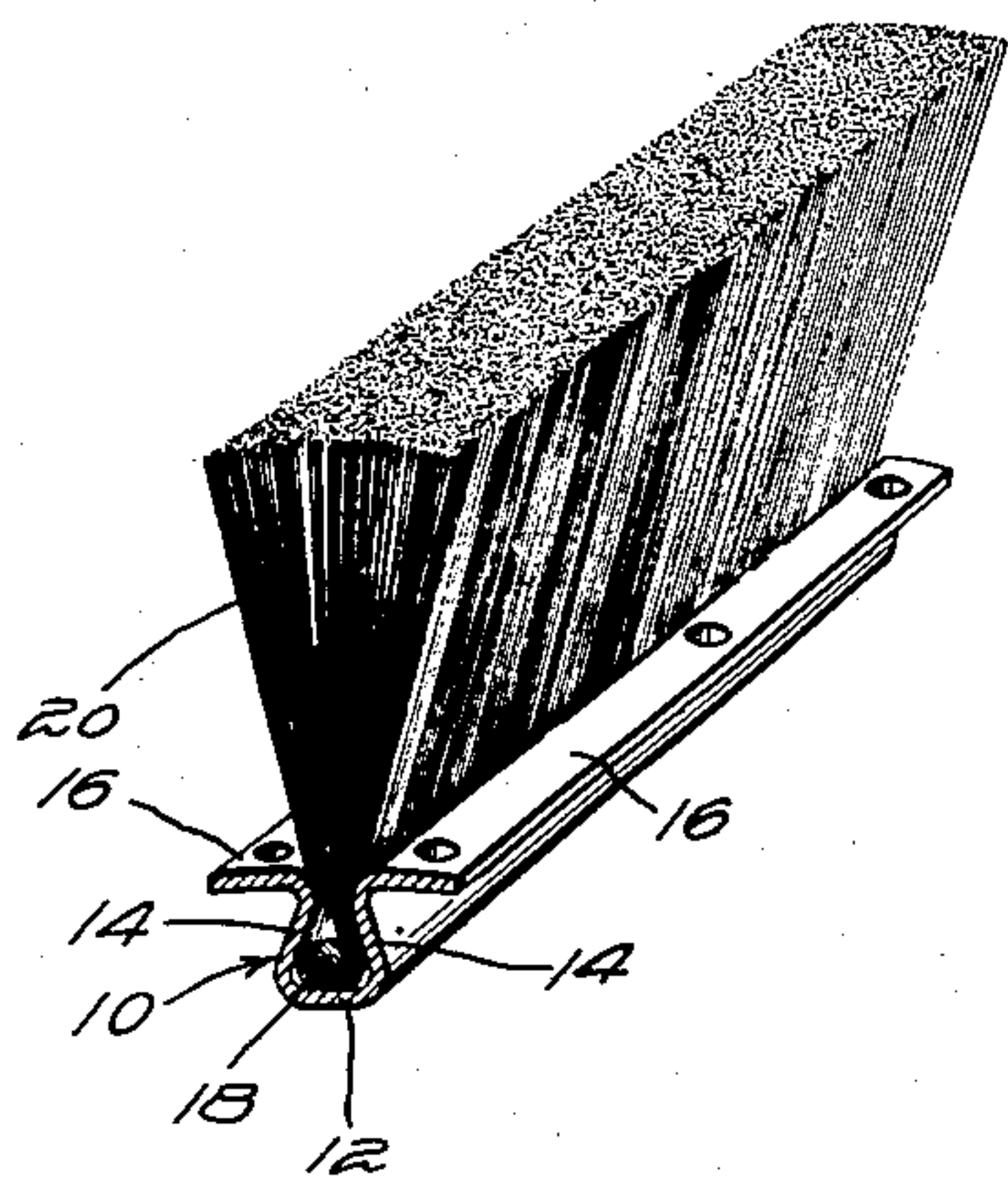


Fig. 2.

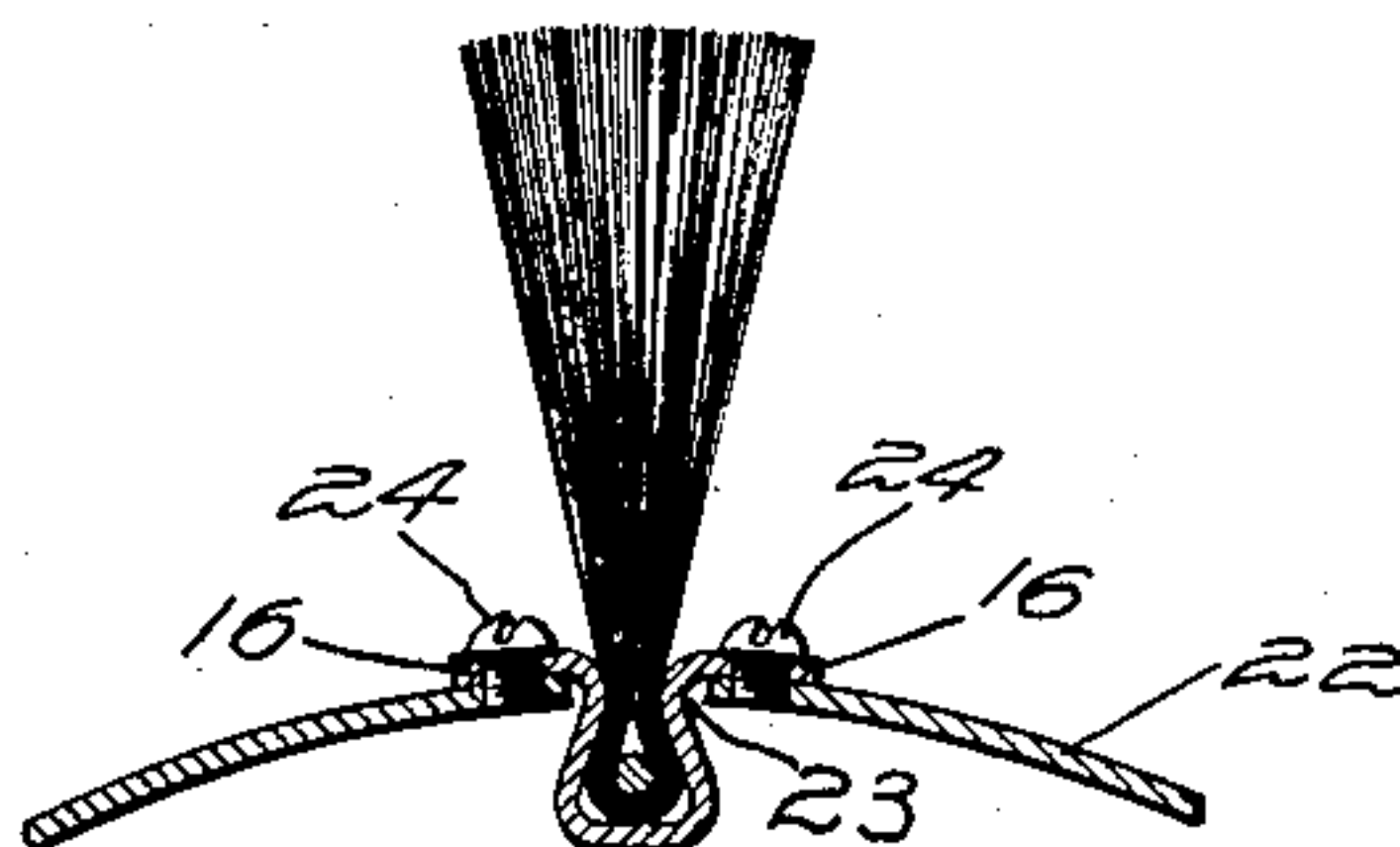


Fig. 3.

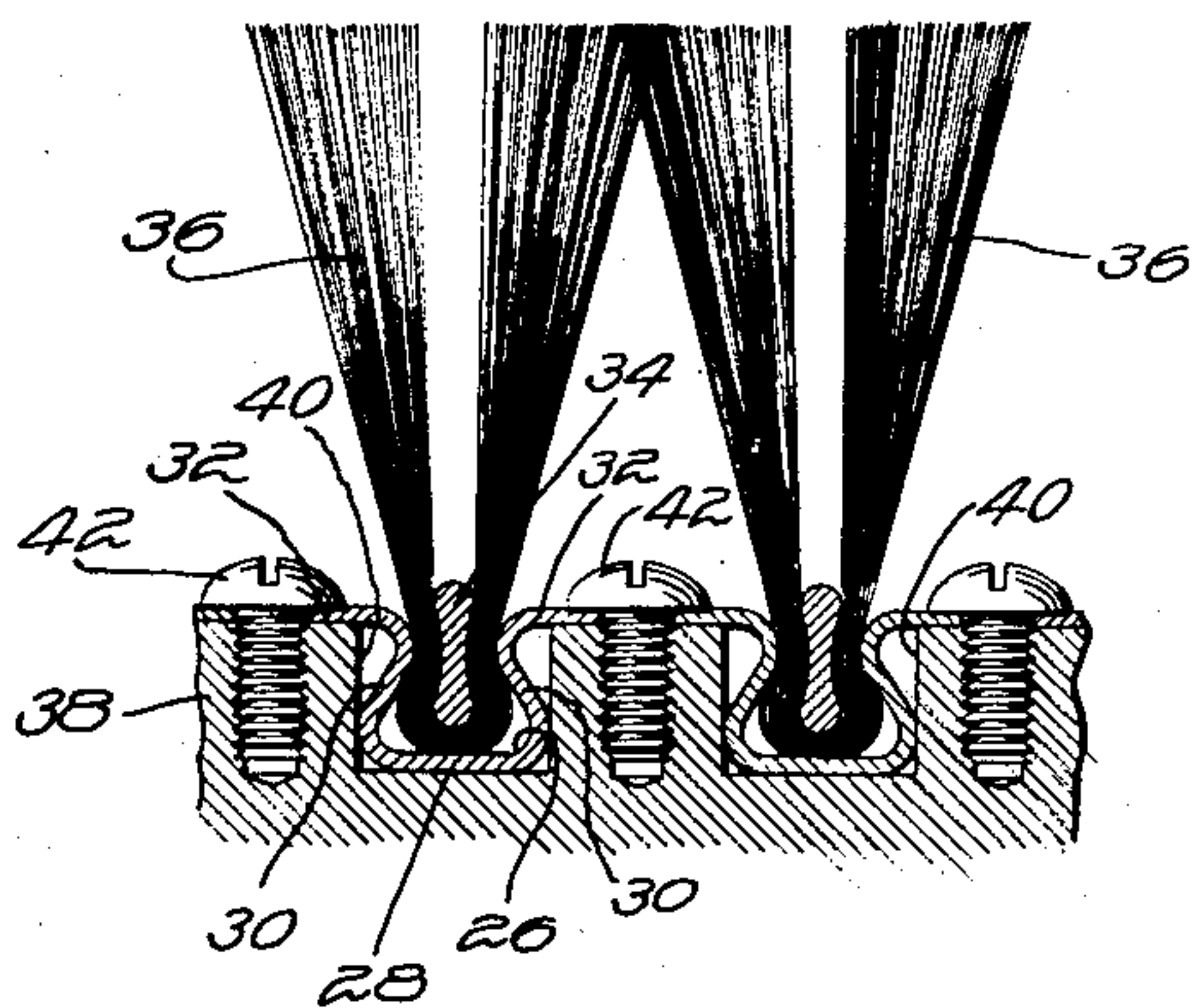


Fig. 4.

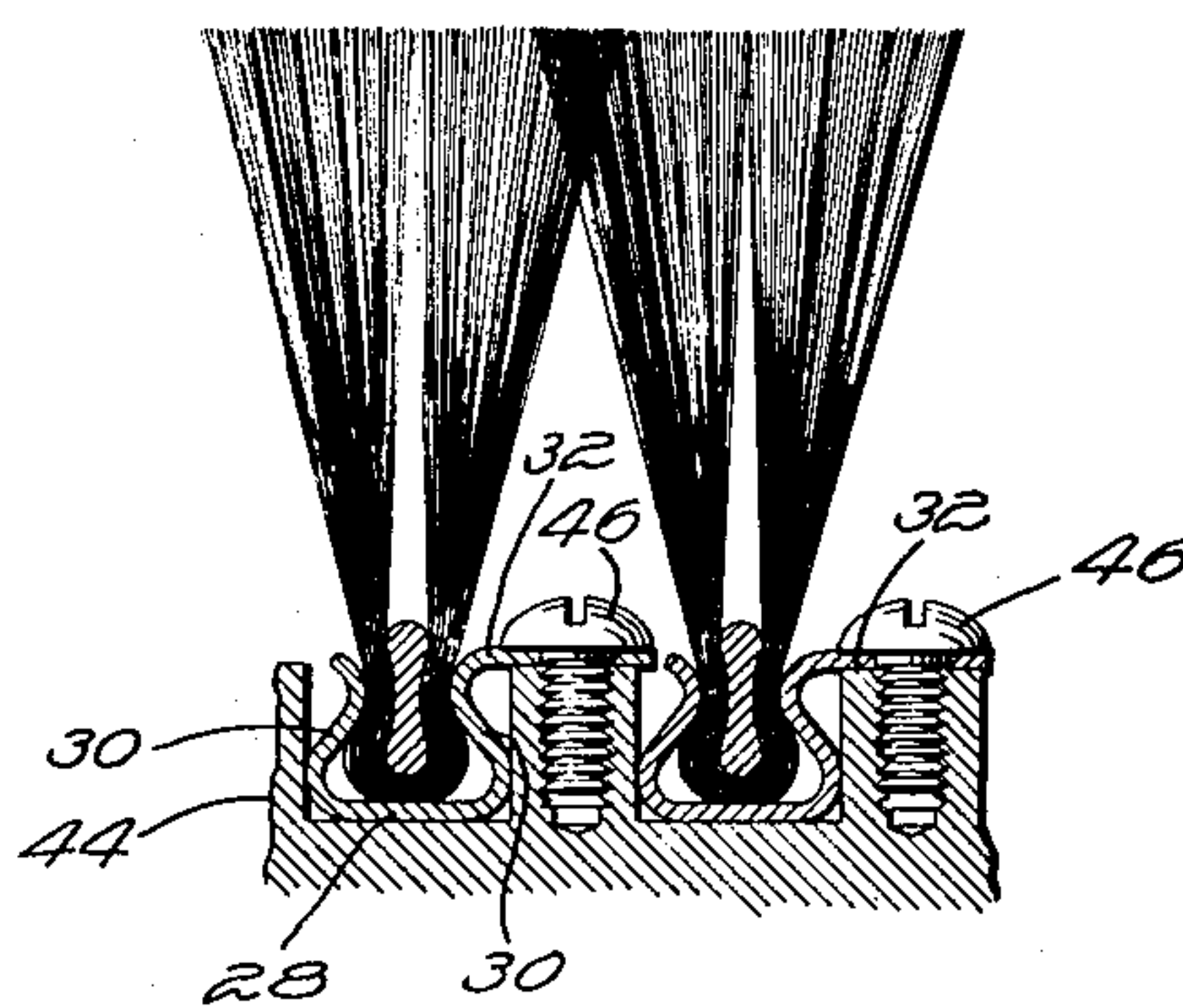


Fig. 5.

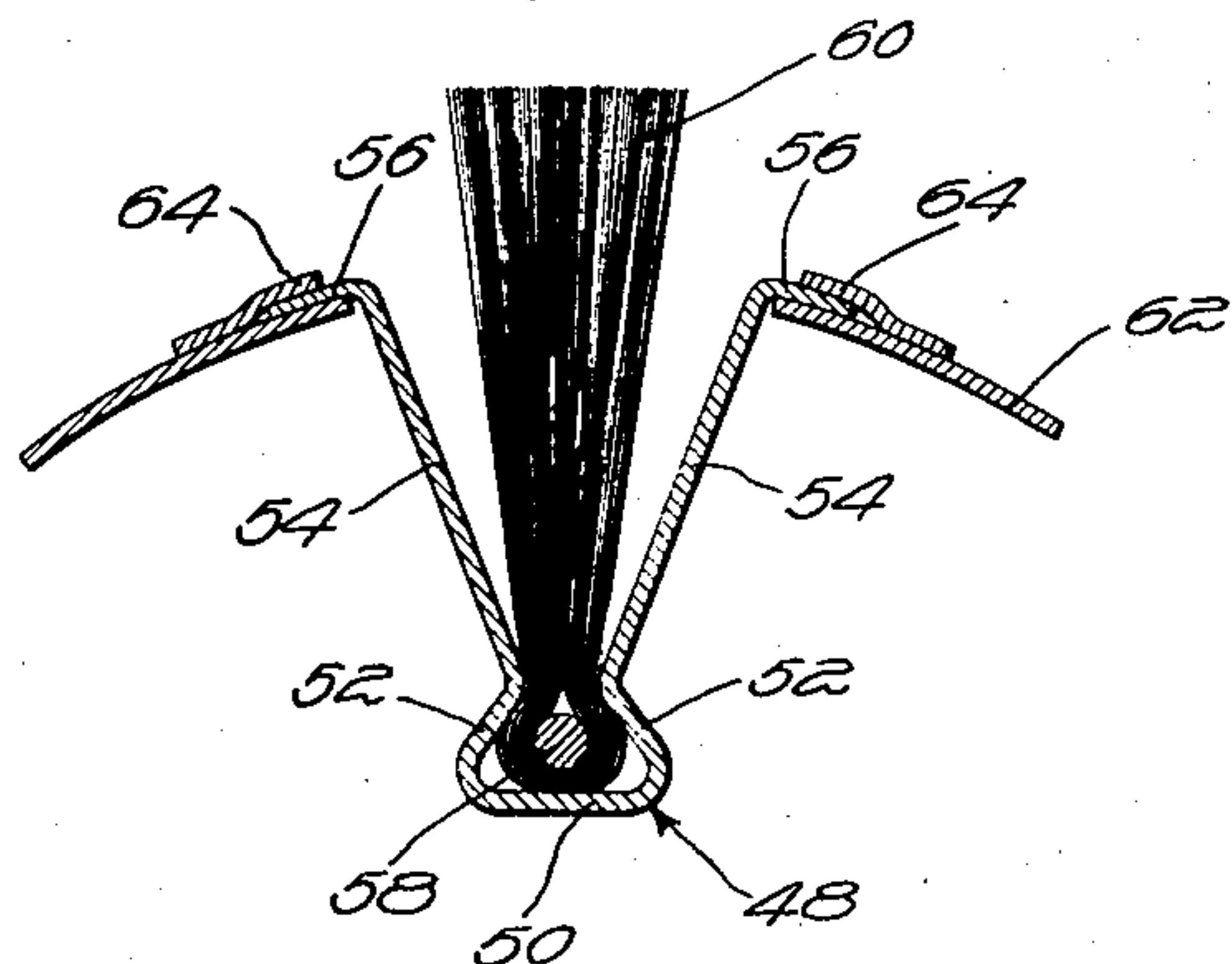
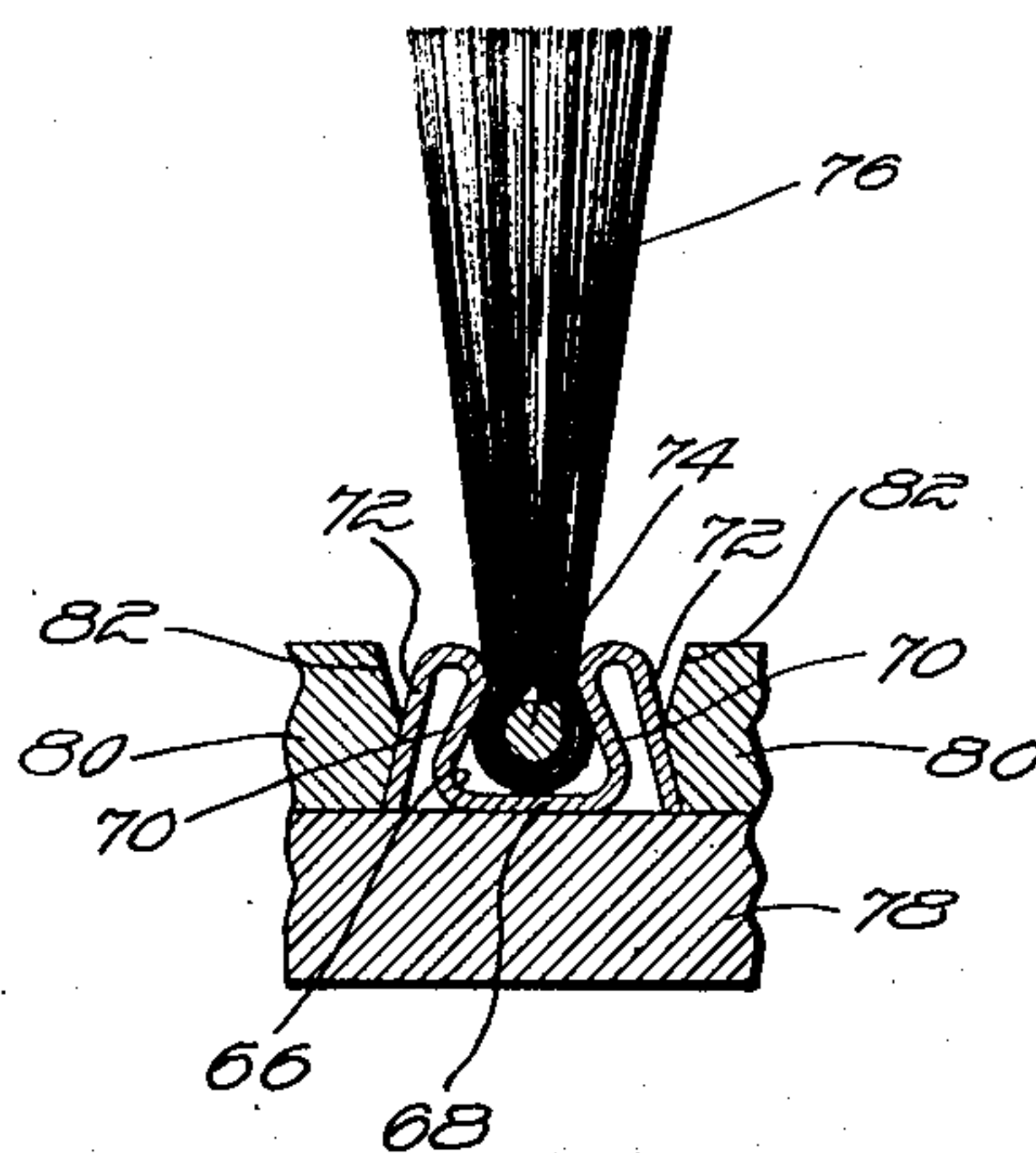


Fig. 6.



Inventor
Henry Cave
by S. Jay Teller
Attorney

UNITED STATES PATENT OFFICE

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BRUSH WITH ELEMENT OF THE CHANNEL
STRIP TYPEHenry Cave, Hartford, Conn., assignor to The
Fuller Brush Company, Hartford, Conn., a cor-
poration of Connecticut

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3 Claims. (Cl. 15—199)

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The invention relates to a brush comprising a holder and a brush element of the channel strip type connected with the holder. The invention further relates to the channel strip brush element as a separate article.

A brush element of the channel strip type includes a longitudinal metal strip shaped to form a rear wall and two forward converging side walls constituting a channel, and includes fibers projecting in generally forward directions through the channel neck between the converging side walls. Ordinarily there is a longitudinal core wire at least partly within the channel and the fibers are folded around the core wire within the channel and having their end portions protruding.

In accordance with prior practice, brush elements of the channel strip type have been secured to their holders by various devices or means which have directly engaged the side walls of the channel. In some instances, the brush elements have been held by being pushed endwise into undercut grooves shaped to receive them, and in some instances one or both of the converging side walls have been directly engaged by relatively movable clamping devices. In other instances, the fibers have been removed or omitted at the extreme ends of the channel strip, and the brush element has been held in place by direct engagement with the fronts of the channel side walls at the said ends.

The general object of the present invention is to provide means for holding the brush elements of the type defined without depending upon direct engagement with the forward converging side walls thereof. The said object of the invention is attained by providing the channel strip with either one or two integral laterally positioned flanges which engage or are adapted to engage either one or two longitudinal faces on the holder. Any one of a variety of means may be provided for retaining the flange or flanges in place and for thus securing the brush element to the holder.

A further object of the invention is to provide a brush element of the type defined having means whereby the said element has greatly increased resistance to lateral bending or distortion.

Other objects of the invention will be apparent from the drawing and from the following specification and claims.

In the drawing I have shown in detail several embodiments of the invention, but it will be understood that various changes may be made from the constructions shown, and that the

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drawing is not to be construed as defining or limiting the scope of the invention, the claims forming a part of this specification being relied upon for that purpose.

Of the drawing:

Fig. 1 is a perspective view of a portion of a brush element embodying the invention.

Fig. 2 is a transverse sectional view of the brush element shown in Fig. 1, the view also showing a portion of a cylindrical holder on which the brush element is mounted.

Fig. 3 is a view similar to Fig. 2 but showing a plurality of brush elements mounted on a somewhat different holder.

Fig. 4 is a view similar to Fig. 3, but showing alternative brush elements each having but one flange.

Fig. 5 is a view somewhat similar to Fig. 2, but showing an alternative brush element and an alternative holder therefor.

Fig. 6 is a view somewhat similar to Fig. 3, but showing another alternative brush element and an alternative holder therefor.

Referring to the drawings, particularly Figs. 1 and 2, 10 is a metal strip having longitudinal edges, the said strip being transversely shaped along longitudinal lines to form a rear wall 12 and two forward converging side walls 14, 14 constituting a channel with a narrow neck at the front. The said strip 10 is further transversely shaped along longitudinal lines to form at least one laterally positioned longitudinal supporting flange 16 integral with the corresponding side wall and extending laterally from the front portion thereof. Ordinarily there are two similar supporting flanges 16, 16 as shown. These flanges are relatively narrow and each of them has an exposed longitudinal edge parallel throughout its length to the said channel. As shown, the flanges 16, 16 extend transversely and are parallel or approximately parallel with the rear wall 12.

A layer of fibers 20 of any suitable character is provided, the end portions of the said fibers projecting in generally forward directions through the channel neck between the converging side walls. Ordinarily there is a longitudinal core wire 18 which is at least partly within the aforesaid channel of the strip. A round wire is shown which is entirely within the channel. When a core wire is provided, the fibers are folded around the said wire within the channel. During manufacture the layer of fibers 20, while straight, is deposited with the core wire 18 on the channel strip before the sides thereof are

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closed to their final positions. The core wire is guided into the channel, thus folding the layer of fibers around it. The side walls of the channel strip are then rolled or pressed against the fibers to bind the several parts together by pressure. The layer of fibers is in engagement with and gripped by the sides of the narrow channel neck. The character of the metal of the channel strip is such that the sides of the strip are permanently set so as to maintain the pressure against the fibers.

The brush element comprising the channel strip with its flanges and the core wire and the fibers is supported upon or adapted to be supported upon a holder having a longitudinal recess in which the channel portion of the strip is positioned. The holder has at least one longitudinal face and ordinarily two such faces immediately adjacent the recess for engagement with the flange or flanges of the strip. The details of the holder may be widely varied, but as shown in Fig. 2, the holder is a rotatable sheet metal cylinder 22 having a longitudinal slot 23 therein constituting the recess. The portions of the outer surface of the cylinder adjacent the slot constitute the aforesaid longitudinal faces. The flanges 16, 16 can be retained in engagement with the said longitudinal faces by any suitable means, and as shown, there are screws 24, 24 extending through holes in the flanges and into threaded holes in the cylinder.

It will be seen that with a brush embodying the invention, the brush element is secured in place by means of the flanges thereof. They are not held by engagement with the side walls 14, 14 as has been the prior practice. The flange or flanges on the channel strip provide greatly increased resistance to lateral bending of the brush element, this being important in many instances. The fibers are firmly gripped at the narrow neck between the side walls of the channel member, but in use, there is frequently a tendency by reason of local conditions for portions of the side walls to yield laterally with the result that the corresponding fibers are not properly held. With the present construction, particularly when two flanges are provided, the side walls of the channel are reinforced by the flanges. This greatly reduces the possibility of any localized yielding of the channel side walls.

Fig. 3 shows a brush generally similar to that shown in Figs. 1 and 2 but differing in various details. There is a metal strip 26 generally similar to the strip 10 and having a rear wall 28, side walls 30, 30 and either one or two flanges 32, 32. There is a core wire 34 with relatively wide outer and inner portions and a narrower connecting portion. The core wire 34 is positioned only partly within the channel, the narrower connecting portion thereof being at the channel neck between the converging side walls. Fibers 36 are folded around the core wire as already described, the shape of the core wire giving the fibers a greater angular spread.

A holder 38 is provided having one or more longitudinal recesses 40, 40 shaped to receive the channel portion of the strip and to engage the rear and side walls thereof. The holder 38 has at least one longitudinal face and preferably two such faces adjacent each recess for engagement with the flange or flanges of the corresponding strip. The flanges 32, 32 can be retained in engagement with the said longitudinal faces by any suitable means, and as shown, there are screws 42, 42 entering threaded holes in the

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holder and so located that their heads overlies and engage the edge portions of the flanges.

Fig. 4 shows a brush very similar to that shown in Fig. 3 and differing therefrom chiefly in the provision of only a single flange 32 on each channel strip. The holder 44 is similar to the holder 38 but the spacing between the recesses may be less. For holding the single flange 32 in engagement with the longitudinal front face on the holder there are provided screws 46, 46 extending through holes in the flange and into threaded holes in the holder.

Fig. 5 shows a strip 48 which differs substantially from the strips 10 and 26. The strip 48 is shaped along longitudinal lines as already described to form a rear wall 50 and side walls 52, 52. The strip is further shaped along longitudinal lines to form two diverging integral longitudinal walls 54, 54 extending generally forward from the fronts of the converging side walls 52, 52. The strip 48 is still further shaped along longitudinal lines to form two opposite relatively narrow longitudinal supporting flanges 56, 56 extending transversely from the fronts of the diverging walls 54, 54 and having exposed longitudinal edges. A core wire 58 and fibers 60 are provided which may be similar to those already described in connection with Figs. 1 and 2.

A holder 62 is provided which is a rotatable cylinder generally similar to the cylinder 22 shown in Fig. 2, but provided with a substantially wider recess. The flanges 56, 56 can be retained in engagement with the longitudinal faces on the cylinder by any suitable means, and as shown the cylinder has longitudinal retaining strips 64, 64 welded or otherwise secured thereto, these strips being shaped to overlie the edge portions of the flanges 56, 56. The brush element can be put in place on the cylinder or removed therefrom by longitudinal movement.

A brush as shown in Fig. 5 has the advantage that the ends of the fibers are nearer the periphery of the cylinder, but are nevertheless at a proper distance from the channel portion of the strip for the required flexibility.

Fig. 6 shows a brush somewhat similar to that shown in Figs. 1 and 2 but differing as to the positions of the flanges and as to the character of the holder. There is a metal strip 66 having a rear wall 68, side walls 70, 70 and flanges 72, 72. The flanges 72, 72, instead of extending transversely parallelly with the rear wall 68, extend in generally rearward directions. The flanges preferably diverge toward the rear. A core wire 74 and fibers 76 are provided which may be similar to those already described in connection with Figs. 1 and 2.

A holder is provided having a base 78 and longitudinal bars 80, 80 secured to the base, a longitudinal recess being formed between each two adjacent bars. The bars 80, 80 have inclined walls adjacent the base for engagement with the outer faces of the flanges 72, 72. The bars 80, 80 may also have oppositely inclined walls 82, 82 adjacent their fronts.

It will be seen that the brush element is held in place on the base by reason of the engagement of the inclined outer faces of the flanges 72, 72 with the similarly inclined faces on the bars 80, 80. The brush element can be put in place on the holder or removed therefrom by longitudinal movement or alternatively by disconnecting the bars 80, 80 from the base 78.

What I claim is:

1. The combination in a brush, of a metal

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strip which has longitudinal edges and is transversely shaped along longitudinal lines to form a rear wall and two forward converging side walls constituting an open-front longitudinal channel with a narrow neck at the front and which is further transversely shaped along longitudinal lines to form an integral longitudinal supporting flange extending laterally from the front portion of one of the said converging side walls and substantially parallel to the said rear wall, the said flange being relatively narrow and having a laterally exposed longitudinal edge parallel throughout its length to the said channel, a longitudinal core wire at least partly within the channel of the strip, a layer of fibers folded around the core wire within the channel and having the end portions of the fibers projecting in generally forward directions through the said neck between the converging side walls, the said folded layer of fibers being in engagement with and gripped by the sides of the said channel neck, a holder having a longitudinal recess in which the channel portion of the strip is positioned and having immediately adjacent the recess a longitudinal face which is substantially parallel to the said rear wall of the channel and which directly engages the said supporting flange, and means for retaining the said flange in engagement with the said face so as to hold the strip in place.

2. The combination in a brush, of a metal strip which has longitudinal edges and is transversely shaped along longitudinal lines to form a rear wall and two forward converging side walls constituting an open-front longitudinal channel with a narrow neck at the front and which is further transversely shaped along longitudinal lines to form two opposite integral longitudinal supporting flanges extending laterally from the front portions of the respective converging side walls and substantially parallel to the said rear wall, the said flanges being relatively narrow and having laterally exposed longitudinal edges parallel throughout their lengths to the said channel, and the said flanges being engageable with a suitable longitudinal holder for supporting the strip on the holder, a longitudinal core wire at least partly within the channel of the strip, and a layer of fibers folded around the core wire within the channel and having the end portions of the fibers projecting in generally forward directions through the said neck between the converging side walls, the said folded layer of fibers

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being in engagement with and gripped by the sides of the said channel neck.

3. The combination in a brush, of a metal strip which has longitudinal edges and is transversely shaped along longitudinal lines to form a rear wall and two forward converging side walls constituting an open-front longitudinal channel with a narrow neck at the front and which is further transversely shaped along longitudinal lines at the front to form two opposite integral relatively narrow longitudinal supporting flanges having exposed longitudinal edges, the said flanges extending from the fronts of the side walls and being substantially parallel with the rear wall, a longitudinal core wire at least partly within the channel of the strip, a layer of fibers folded around the core wire within the channel and having the end portions of the fibers projecting in generally forward directions through the said channel neck between the converging side walls, the said folded layer of fibers being in engagement with and gripped by the sides of the said channel neck, a holder having a longitudinal recess with a width at the front at least equal to the width of the channel portion of the strip which recess is shaped to receive the said channel portion of the strip and to engage the rear and side walls thereof, the said holder having two longitudinal front faces adjacent the recess with which the flanges of the strip are engaged, and means for retaining the said flanges in engagement with the said faces so as to hold the strip in place.

HENRY CAVE.

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