Nov. 7, 1939. H. SIEMUND 2,179,223

SQUEEGEE CLEANING TOOL

Filed July 10, 1937

Fig. 1.

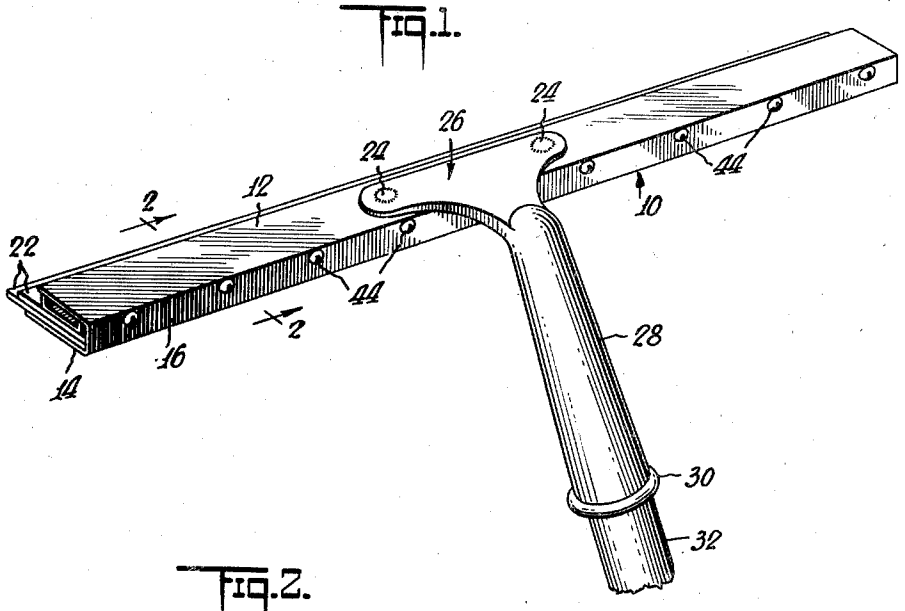



Fig. 2.

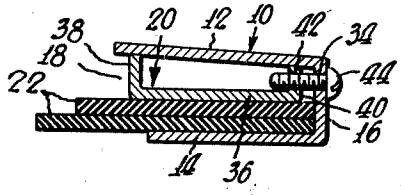



Fig. 3.

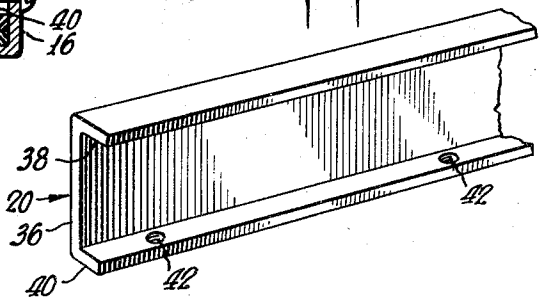



Fig. 4.

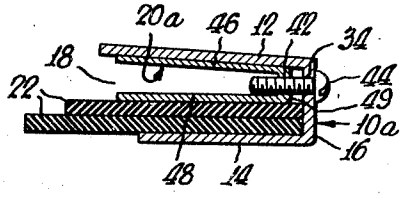
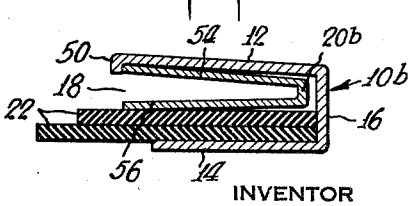



Fig. 5.




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Patented Nov. 7, 1939

2,179,223

# UNITED STATES PATENT OFFICE

2,179,223

## SQUEEGEE CLEANING TOOL

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Application July 10, 1937, Serial No. 152,906

6 Claims. (Cl. 15—245)

The present invention relates generally to improvements in cleaning tools especially adapted for use in the cleaning of floors, windows and the like, and it has particular relation to a cleaning tool of the squeegee type consisting of an elongated channel-like frame or holder having one or more wiping blades of fabric, rubber, rubber and fabric, felt, etc., removably secured therein.

The conventional devices of the character described, which are found in extensive use at the present time, consist of an elongated channel-like holder having a flexible wiping blade made up of one or more strips of flexible wiping material tightly secured therein by means of machine bolts or other similar fastening means mounted on the holder and extending through perforations made along one edge of the flexible wiping strips.

The conventional devices hereinabove identified have a great many disadvantages. all of which are being obviated by the present invention. For example, the perforations in the flexible wiping strips for receiving the securing means actually materially weakens the strips and consequently greatly shortens the actual operating life thereof. A considerable strain is placed on these flexible wiping strips when the holder is being squeegeed over the surface being cleaned, which strain quite frequently causes the securing means to tear through the material which has been weakened by the perforations. When this happens the flexible strips are rendered unfit for further use, and must be replaced since they can no longer be firmly secured in the holder. Another great disadvantage of these conventional devices is that the perforations prevent reversal of the flexible wiping strips when the original wiping edge becomes worn or otherwise rendered unfit for further use.

Still another disadvantage of the present conventional holders is that dealers in such devices are required to maintain extensive stocks of various sizes of measured and perforated replacement strips for replacing worn out blades of holders of various makes and/or sizes, which require different types of strips and differently spaced perforations. If a dealer does not carry a supply of ready made blades in stock, then in order to satisfy the purchasers of such devices he must carry rolls of uncut stock material from which he must personally measure, perforate and fit the required replacement strips. The time, trouble, patience and risk involved in making accurately spaced perforations to fit a particular holder makes such replacement business highly unattractive, and especially when consideration is given to the small value of such sales.

A further objectionable feature of the conventional devices, wherein the securing means is mounted transversely and vertically of the channel-like holder, is that the position of the securing means frequently causes the latter to engage and snare the chamois skins used to clean the flexible wiping edge periodically, thereby damaging the same by tearing and materially shortening their normal and useful life.

An object of the present invention is to provide a cleaning device of a simple and inexpensive construction that will enable the owner to firmly secure one or more flexible strips of wiping material therein without necessitating the perforation of said strips to receive the fastening means.

A further object of the invention is the provision of a cleaning device of the character described wherein the flexible wiping strips may be reversed when the original wiping side has become damaged or worn, thereby greatly increasing the operating life of the wiping element.

Another object of the invention is to provide a cleaning device which is adapted to receive and secure the flexible wiping element without requiring any accurate measuring and/or punching for securing the same in said holder.

Another object of the invention is to provide a cleaning device of the character described which has its securing means mounted in such a manner as to obviate the possibility of snaring or otherwise damaging a chamois skin when the same is being used to clean the wiping element.

A further object of the invention is to provide a cleaning device wherein the number of flexible strips used to form the wiping element may be varied without impairing or injuring the usefulness and/or efficiency of the holder.

Another object of the invention is the provision of a device of the character described which will permit the use of strips of flexible wiping material of various thicknesses without requiring adjustment of the securing means to compensate for such variations.

Another object of the invention is the provision of a holder of the character described wherein the flexible wiping strips are firmly clamped and locked therein by a wedging means which is mounted entirely within the elongated receiving channel of the holder, and which re-

quires no tools for fastening or releasing the wiping element therefrom.

Other and further objects and advantages of the invention reside in the detailed construction of the holder, which result in simplicity, economy and efficiency, and which will be apparent from the following description, wherein several preferred forms of embodiment of the invention are shown, reference being had to the accompanying drawing, forming a part thereof, in which:

Fig. 1 is a perspective view of a cleaning device constructed in accordance with the invention;

Fig. 2 is a cross-sectional view of the device shown in Fig. 1, the same being taken substantially along the line 2—2 thereof;

Fig. 3 is an enlarged, fragmentary, perspective view of the clamping or wedging bar shown in Figs. 1 and 2;

Fig. 4 is a cross-sectional view (similar to Fig. 2) of a cleaning device constructed in accordance with the invention, and illustrating a modified form of clamping or wedging bar being used in connection with the holder of Fig. 1;

Fig. 5 is a cross-sectional view (similar to Fig. 2) of another modified form of cleaning device constructed in accordance with the invention, and illustrating a spring steel clamping or wedging bar requiring no separate securing means.

Referring now in detail to the drawing, wherein like numerals indicate like parts, there is shown an elongated metal channel-like holder or frame member 10, substantially of U-shape construction, having an outwardly and upwardly transversely extending long upper or top arm 12, an outwardly transversely extending short lower or bottom arm 14, and a connecting back portion 16, said arms 12 and 14 extending outwardly in a slightly diverging direction thereby forming a channel like opening 18 therebetween of diminishing dimensions progressively inwardly toward the back portion 16 thereof. A clamping or wedging bar 20 and a plurality of flexible strips 22, which comprise the wiping element, are adapted to be removably mounted in the channel-like opening 16 of the holder 10.

Mounted intermediate the ends of the top arm 12, by spot-welding or other suitable means as indicated at 24, is a handle receiving socket member 26, which is provided with a hollow tubular portion 28 having an external locking ring 30. The hollow tubular handle portion 28 is adapted to wedgingly receive an extension handle member 32, such as a mop handle or the like, for manipulation of the holder 10 in cleaning surfaces beyond the normal reach of the operator.

The connecting back portion 16 of the U-shaped frame member 10 is provided with a series of longitudinally spaced apertures 34 adjacent the upper edge thereof and just below the juncture of the upper arm 12 for receiving the securing means.

The clamping or wedging bar 20 is of U-shape construction, having a relatively wide back portion 36 as compared to its projecting arms 38 and 40, is adapted to be mounted within the channel-like opening 18. It will be noted that the projecting arm 40 of the bar 20 is shorter than the arm 38 thereof, and that the arm 40 is provided with a series of longitudinally spaced internally threaded openings 42, the spacing of the openings 42 correspond to the spacing of the openings 34 in the back portion 16 of the frame member 10 so that when the bar 20 is properly positioned in the frame member 10 the openings 34 and 42 may be brought into alignment. The securing means, which may consist of a machine screw or bolt 44 is mounted through the openings 34 of the back portion 16 of the frame member 10 from the back side thereof so that its threaded shank projects into the channel-like opening 18. Thereupon, the projecting ends of the bolts 44 may be threaded into the internally threaded openings 42 of the arm 40 of the bar 20 to engage the same. When the clamping members 20 and 20*a* are in their clamping positions, as shown in Figs. 2 and 4, respectively, it will be noted that the threaded ends of the securing means or bolts 44 passes entirely through said clamping member and terminates within the channel thereof, thereby preventing these threaded projecting ends from coming into contact with and snagging the chamois skins. The width of the clamping bar 20 is less than the width of the projecting upper arm 12 of the frame member 10 against which it is adapted to slidably operate on the arms 38 and 40 when mounted within the channel-like opening 18 by means of the bolts 44.

The flexible wiping element, which may consist of one or more strips of suitable flexible material 22, is manually positioned in the channel-like opening 18 between the outer surface of the back 36 of the clamping bar 20 and the inner surface of the lower arm 14 of the frame structure 10 with its inner side edge abutting the back portion 16 thereof, as best shown in Fig. 2. While only two strips of flexible material 22 of different widths are shown secured in the holder 10 of the drawing, it will be apparent to those skilled in the art that the number of such strips to be used, the thickness of such strips, etc., may be varied at will without affecting the operation of the clamping means. Therefore, it is to be understood that the flexible strips 22 may be varied at the discretion of the operator without departing from the utility of the holder or from the spirit of the invention.

While it is believed that the assembly of the holder is quite obvious from the foregoing description, the same may be briefly summarized as follows: The bolts 44 are manually positioned in the openings 34 of the back portion 16 of the holder 10 from the rear side thereof so that their threaded shanks will project into the channel-like opening 18. The U-shaped clamping bar 20 is positioned in the channel-like opening 16 with its projecting arms 38 and 40 engaging the underside of the top arm 12 of the holder 10, the arm 40 having the internally threaded openings 42 being positioned adjacent the back 16 of the holder 10. While the clamping bar 20 is maintained in this position, the openings 34 and 42 being in proper alignment, the screws 44 may be partially threaded into the openings 42 until the clamping bar 20 is secured loosely within the channel-like opening 16 of the holder 10. The flexible strips 22, comprising the wiping element or blade, may now be positioned within the channel-like opening 18 between the back 36 of the clamping bar 20 and the inside surface of the adjacent lower arm 14 of the holder 10, and with the inner side edge of said strips 22 contacting the back portion 16 of said holder 10. In this position the screws 44 may be tightened, thereby drawing the clamping bar 20 inwardly of the channel-like opening 18 toward the back 16 of the holder 10. Since the outer

projecting arm 38 of the clamping bar 20 is longer than the inner arm 40 thereof, and since the channel-like opening 18 narrows as it approaches the back portion 16, it follows that any inward movement of the clamping bar 20 transversely of the channel-like opening 18 will cause the back 36 of the clamping bar 20 to approach the arm 14, thereby wedgingly or clampingly locking the flexible strips 22 therebetween.

In the modified construction shown in Fig. 4 the elongated channel-like holder 10*a* is of identical construction to the holder 10 in Figs. 1 and 2, but the clamping bar 20*a* is of slightly different construction. The clamping bar 20*a* is made of spring steel, and is of a U-shaped construction having outwardly diverging arms 46 and 48 of equal length and a connecting back portion 49 provided with longitudinally spaced internally threaded apertures 42 for receiving the bolts 44 which comprise the securing means. In this modification it will be noted that the clamping bar 20*a* is mounted telescopically or in a nested position within the frame member 10*a*, and that the flexible strips 22, which comprise the wiping element, are secured in the manner heretofore described between the arms 48 and 14.

In the modification shown in Fig. 5, the outwardly projecting top arm 12 of the elongated channel-like holder 10*b* is provided with a relatively short integrally formed projecting flange 50, which extends downwardly from the top arm 12 adjacent the outer edge thereof and inwardly of the channel-like opening 18 of the holder 10*b*. A U-shaped spring steel clamping bar 20*b*, having outwardly diverging arms 54 and 56, which are slightly shorter than the distance between the back portion 16 of the holder 10*b* and the downwardly projecting flange 50, is adapted to be used for removably clamping or wedging the flexible strips 22 within the holder 10*b*. In the operation of this modified form of device, the flexible strips 22, comprising the wiping element, are first positioned in the channel-like opening 18 on top of the arm 14 of the holder 10*b* with their back edges contacting the back portion 16 thereof. The clamping bar 20*b* is now ready to be inserted in position in channel-like opening 18, and this may be manually accomplished by merely pinching the outwardly extending arms 54 and 56 together, thereby compressing the same into a form whereby it may be readily slipped into the opening 18 between the top of the strips 22 and the underside of the top arm 12 behind the flange 50. When the clamping bar 20*b* is properly positioned, the compression may be released and the arms 54 and 56 will tend to separate and return to their normal expanded position, whereupon the arm 54 will become locked behind the flange 50 and the flexible strips 22 will become tightly and firmly clamped by the expanding pressure of the spring steel clamping bar 20*b* between the arm 56 and the arm 14 of the members 20*b* and 10*b* respectively. To release the flexible strips 22 from the holder 10*b*, the arm 54 of the clamping bar 20*b* is compressed until it is below the flange 50, whereupon it may be removed from the channel-like opening 18 in any suitable manner thereby releasing the wiping element.

It is obvious that in the above constructions it is possible to vary the thickness or number of strips of flexible material 22 comprising the wiping element without difficulty or loss of efficiency, and that new strips may be readily prepared from a roll of stock material merely by cutting the same to length, thus the necessity of making precision measurements and punching accurately spaced holes to correspond to the spacing arrangement of the clamping bolts has been eliminated. It will be further apparent that, when one side of the flexible strips 22 becomes worn through use, they may be easily and quickly reversed in the frame structure and the opposite edge thereupon used, the worn or damaged edge having no effect on the clamping or securing means whatsoever. Manifestly, the normal and useful life of the wiping element of the present holder is doubled, thereby greatly reducing the actual operating cost of the device. Furthermore, dealers in such devices need no longer carry large and expensive stocks of ready made wiping blades for replacement purposes, or continue the unprofitable practice of making and refitting new blades. It will also be noted that in the modifications shown in Figs. 1 to 4, inclusive, the securing means is mounted in the back of the frame member 10, thereby removing the danger of snaring or tearing the chamois-skin when the same is used in cleaning the flexible wiping edge, and that in the form shown in Fig. 5 the securing means is mounted entirely within the channel-like opening.

Although I have only described in detail several modifications which the invention may assume, it will be readily apparent to those skilled in the art that the invention is not so limited, but that various other modifications may be made therein without departing from the spirit thereof or from the scope of the appended claims.

What I claim is:

1. In a cleaning device of the character described, an elongated wiping element, an elongated U-shaped holder therefor, an elongated U-shaped clamping member adapted to be mounted entirely within the channel of said holder, and securing means mounted in the back of said holder having a free end for engaging the clamping member and moving it transversely along one arm of said holder for wedgingly securing said wiping element therebetween, the free end of said securing means terminating within the channel of said clamping member.

2. In a cleaning device of the character described, an elongated wiping element, an elongated channel-shaped holder therefor having outwardly diverging arms of unequal length, an elongated channel-shaped clamping member adapted to be slidably mounted entirely within the channel of said holder and along the longer arm thereof, and means for engaging said holder and clamping member for wedgingly securing said wiping element between said clamping member and the shorter arm of said holder, said securing means having one end terminating within the channel of said clamping member.

3. In a cleaning device of the character described comprising an elongated U-shaped supporting structure having outwardly projecting arms forming a longitudinally extending receiving channel, a U-shaped clamping member having outwardly projecting arms of unequal length forming a longitudinally extending channel, and securing means engageable with the back of said holder and the shorter arm of said clamping member for securing the wiping element wedgingly therebetween when the clamping member is moved transversely of the channel of said supporting structure.

4. In a cleaning device of the character described comprising an elongated U shaped sup-

porting structure having outwardly diverging arms of unequal length forming a longitudinally extending receiving channel, a U-shaped clamping member having outwardly projecting arms of unequal length forming a longitudinally extending channel, said clamping member adapted to be slidably mounted entirely within said receiving channel and along the longer arm of said supporting structure, and securing means engageable with the back of said supporting structure and the shorter arm of said clamping member for securing the wiping element wedgingly therebetween when the clamping member is moved transversely of the longer arm of said structure, said securing means having one end terminating within the channel of said clamping member.

5. In a cleaning device of the character described, an elongated wiping element, an elongated channel-shaped holder therefor, an elongated channel-shaped clamping member having outwardly extending diverging arms adapted to be mounted entirely within the channel of said holder, and securing means projecting from the back of said holder and engaging the back of said clamping member for wedgingly securing said wiping element therebetween, said securing means having one free end which terminates within the channel of said clamping member.

6. In a cleaning device of the character described, an elongated wiping element, a U-shaped holder having a channel extending longitudinally thereof, a U-shaped clamping member having outwardly extending arms forming a channel extending longitudinally thereof, and means having one free end for securing the back of said holder and the back of said clamping member for wedgingly securing said wiping element therebetween, the free end of said securing means terminating within the channel of said clamping member.

HERMAN SIEMUND.