March 21, 1933. C. KÜHNEL ET AL 1,902,561

VACUUM CLEANER

Filed Nov. 23, 1932

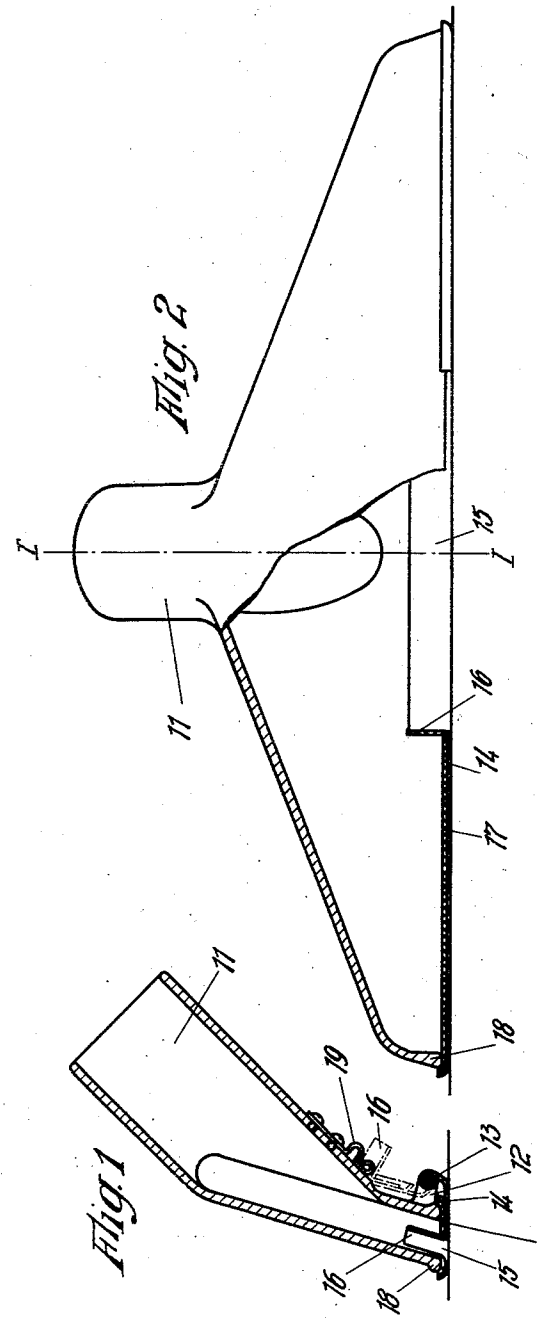



Fig. 2




Fig. 1

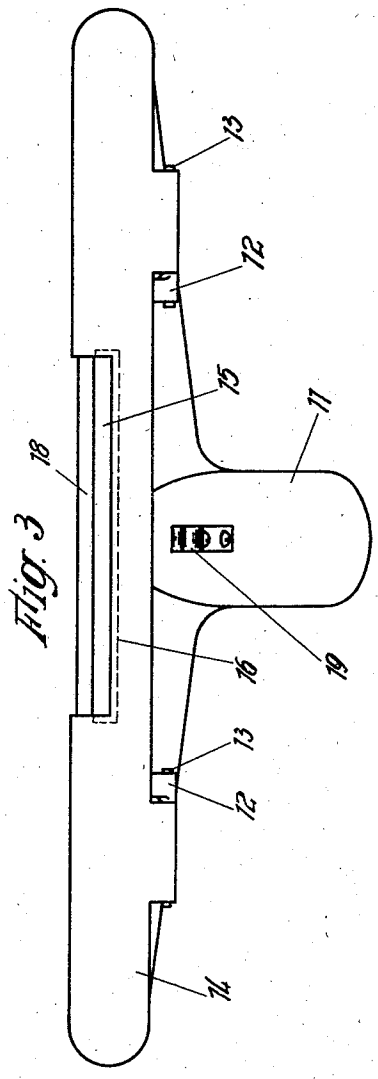



Fig. 3

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# UNITED STATES PATENT OFFICE

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## VACUUM CLEANER

Application filed November 23, 1932, Serial No. 643,966, and in Germany October 27, 1931.

Our invention relates to improvements in vacuum cleaners, and more particularly to suction nozzles therefor.

Suction nozzles for vacuum cleaners employed in most cases for cleaning rugs and carpets have a relatively large inlet opening which in general ensures a sufficiently strong current of air for the removal of dust from rugs and carpets. This current of air does not, however, suffice in the majority of cases to remove threads, hair and the like particles from the rugs and carpets. To this end, it has already been proposed to create a stronger suction action by providing an additional nozzle inlet opening of smaller cross-section which may communicate, for instance, with the flexible suction tube by means of a valve. The nozzles of this character hitherto employed are, however, extremely cumbersome to operate and besides so expensive that they have not come into extensive use.

The object of our invention is to provide an economical suction nozzle simple to operate and of such a strong suction action as to easily remove threads, hair and the like particles from rugs and carpets. With this end in view, we provide at the inlet opening of the nozzle a hinged apertured flap adapted to restrict the cross-section of the inlet opening so as to create a strong current of air. As may be desired, the flap may be easily brought in or out of engagement with the suction nozzle by foot and held in the out-of-contact position by a spring. In the operating position the flap is held in position by the vacuum existing in the flexible suction tube without there being any necessity of providing special means for this purpose.

It is preferably made of sheet-iron, in the central part of which a portion is struck upwardly to provide a flange which at the same time serves to direct the air. To obtain an effective seal against the edge of the inlet opening of the nozzle the flap is preferably fitted with a rubber covering so as to ensure an air-tight joint when operating with a restricted inlet opening.

In the accompanying drawing forming part of this application is represented an embodiment of our invention, similar characters of reference indicating corresponding parts, and in which:

Fig. 1 is a longitudinal sectional view taken on the line I—I of Fig. 2;

Fig. 2 is a front view partly in section and

Fig. 3 is a rear view of the nozzle embodying our invention.

Referring to Fig. 1 pins 13 are fitted in extensions 12 integral with the wall of the nozzle 11 at the rear of the latter and on which a flap 14 is pivotally mounted. The flap 14 closes the inlet opening of the nozzle to a comparatively small portion 15 which is limited by a flange 16 cut out of the flap 14 and bent upwardly so as to form at the same time a guide for the current of air during the suction. The flap 14 is equipped with a rubber covering 17 which in the position shown in the drawing is firmly pressed against the edge 18. When operating upon a surface with the inlet opening proper of the nozzle the flap 14 is rotated to the position as shown at 16 by the dotted lines, and is held in this position by a plate-spring 19 secured to the nozzle by screws.

When operating upon a surface with a higher vacuum for the removal of threads, hair and the like from rugs and carpets, the flap 14 is rotated to the position shown in the drawing by pressing, for instance, the foot against the flange 16. The flap 14 is held in this position by the vacuum prevailing in the suction nozzle. The flap designed according to the invention may be readily applied to any standard suction nozzles used for carpets so that the decrease in cross-section of the inlet opening is ensured in the simplest and most economical manner. Furthermore, the invention has the advantage that the application of the flap to the suction nozzle need not be effected by any auxiliary means so that the cleaning of rugs and carpets is carried out by the nozzle in a most agreeable manner.

We claim as our invention:

1. In a vacuum cleaner, a nozzle having an elongated inlet opening, an apertured flap adapted to restrict the cross-section of said inlet opening, supports integral with said

nozzle at one side of the latter, said flap being pivotally mounted on said supports to bring in and out of engagement said flap with said nozzle, and means for holding said flap out of engagement with said inlet opening.

2. In a vacuum cleaner a nozzle having an elongated inlet opening, a flap adapted to restrict the cross-section of said inlet opening, said flap having in its central portion an opening, supports integral with said nozzle at the rear of the latter, said flap being pivotally mounted on said supports to bring in and out of engagement said flap with said nozzle, and means for holding said flap out of engagement with said inlet opening.

3. In a vacuum cleaner a nozzle having an elongated inlet opening, an apertured flap adapted to restrict the cross-section of said inlet opening, supports integral with said nozzle at the rear of the latter, said flap being pivotally mounted on said supports to bring in and out of engagement said flap with said nozzle, a seal disposed between said flap and said nozzle, and a spring secured to the wall of said nozzle to hold said flap out of engagement with said inlet opening.

4. In a vacuum cleaner a nozzle having an elongated inlet opening, a flap adapted to restrict the cross-section of said inlet opening, said flap having in its central portion an opening and a flange extending for some distance inside said nozzle, supports integral with said nozzle at the rear of the latter, said flap being pivotally mounted on said supports to bring in and out of engagement said flap with said nozzle, and a spring secured to the wall of said nozzle to hold said flap out of engagement with said inlet opening.

In testimony whereof we affix our signatures.

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KARL KORITTKE.