G. P. LULL.

SUCTION ERASER FOR BLACKBOARDS.

APPLICATION FILED MAY 26, 1915.

1,177,714.

Patented Apr. 4, 1916.

Fig. 1.

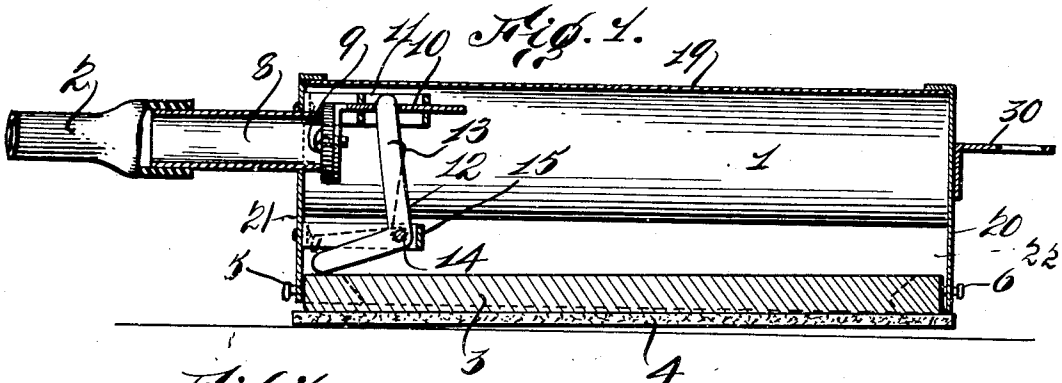

Fig. 3.

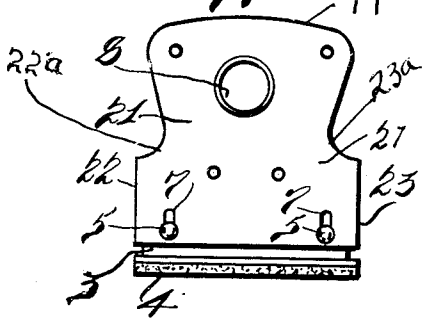

Fig. 2.

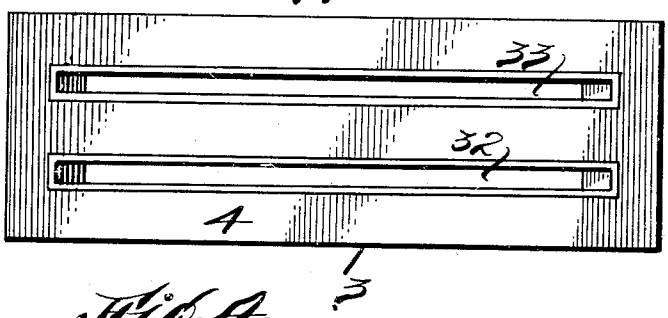

Fig. 4.

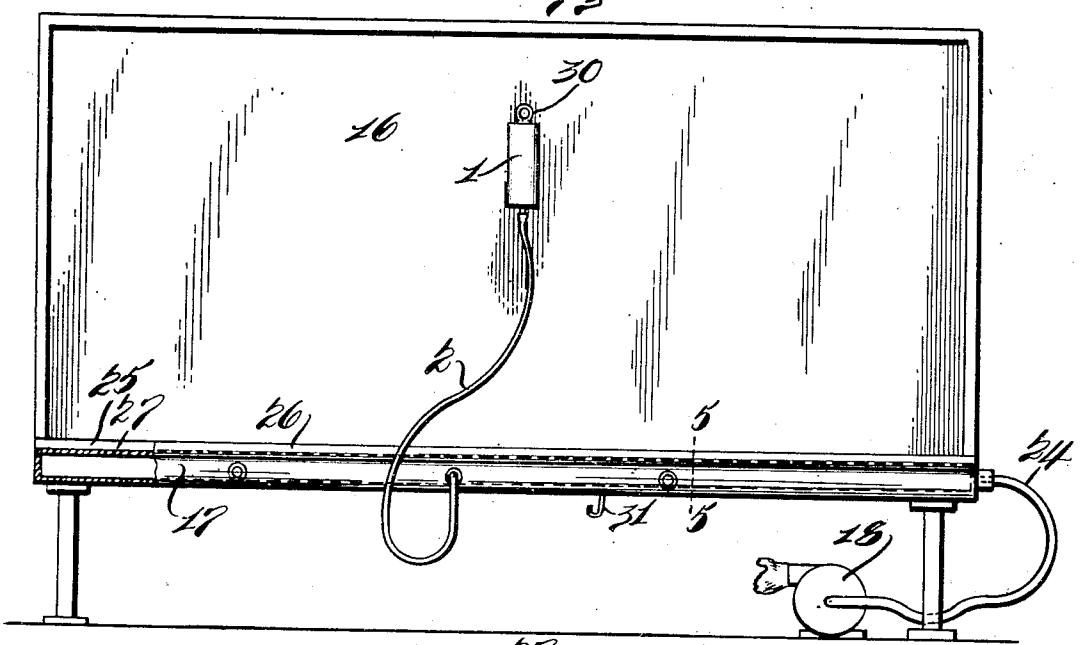

Fig. 5.



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UNITED STATES PATENT OFFICE.

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SUCTION-ERASER FOR BLACKBOARDS.

1,177,714. Specification of Letters Patent. Patented Apr. 4, 1916.

Application filed May 26, 1915. Serial No. 30,532.

To all whom it may concern:

Be it known that I, GEORGE P. LULL, a citizen of the United States, residing at Bradford, Pennsylvania, have invented certain new and useful Improvements in Suction-Erasers for Blackboards, of which the following is a clear, full, and exact description.

This invention relates to improvements in suction erasers or cleaners adapted particularly for erasing and removing chalk from blackboards such as are commonly used in schoolrooms, and the invention further relates to a combination of devices for making such blackboard erasers both simple and efficient in their operation.

The several advantages of the improvement will become fully apparent from the detailed description hereinafter following, and the scope of the invention will be pointed out in the appended claims.

In the preferred embodiment of the invention shown in the drawings, Figure 1 is a longitudinal section through the suction eraser; Fig. 2 is a bottom view of the same; Fig. 3 is an end view of the same; Fig. 4 is a view of several parts in combination as applied for cleaning and erasing chalk from blackboards; and Fig. 5 is a section through the chalk rail along 5—5 of Fig. 4.

Referring more particularly to the drawings, the suction eraser is composed of a hollow elongated casing 1 forming within the same a suction passageway or chamber and having comparatively long side walls 22, 23 and comparatively short end walls 20 and 21. The side walls 22, 23 are formed with the top wall 19 to form a convenient grip for the hand in supporting the eraser. For this purpose the side walls are preferably pressed in at 22^a, 23^a, as shown more clearly in Fig. 3. 3 indicates the bottom member of said hollow casing serving as the rubbing member for the eraser, and as shown said member 3 is preferably pivoted at one end thereof by means of pins 6 engaging the wall 20 of said casing. The other end of said bottom member 3 is preferably provided with pins 5 working in slots 7 of the opposite wall 21 of said casing so as to limit the up and down movement of said bottom member. The bottom member 3 is provided with openings therethrough, preferably in the form of elongated narrow slots 32, 33 as shown in Fig. 2, which openings communicate with the interior chamber of said casing 1. Secured to the bottom member 3 in any suitable way such as by glue, is a layer of rubbing material 4 preferably disposed closely adjacent to the openings of the slots 32, 33, and preferably surrounding the same on all sides.

Passing through one of the short end walls such as 21 of the casing is a pipe connection 8 to receive the end of a flexible suction tube 2. It will be observed that an elongated casing of the form shown is much more conveniently grasped and supported in the hand when the flexible suction tube is connected through one of the short end walls than if the same were connected through the top 19 or one of the side walls 22 and 23. Moreover, it will be seen that the location of the suction opening in one of the small end walls between and above the dust-guiding and suction-concentrating inwardly pressed portions 22^a and 23^a of the side walls facilitates the quick and effective removal of the dust. The inner open end of said pipe 8 is closed by a suitable plug valve member 9 which is formed with a horizontal extension 10 slidably mounted in guides formed in the bracket 11 so as to have a to and fro movement against the opening of tube 8. The supporting bracket 11 is fixed to the inside of the casing 1. Means are provided to operate the valve member 9 by pressure applied to the rubbing side of member 3 and in the present embodiment this means consists of a bell-crank lever 12 pivoted at 14 on a bracket 15 fixed to the inside of the casing. One arm of said bell-crank lever 12 extends through an opening in the extension 10 of said valve, and the other arm of said bell-crank lever 12 is adapted to rest against the upper side of the lower member 3. It will be noted that the arm, which bears upon the member 3, is con-

siderably shorter than the arm connected to the extension 10, the purpose of this difference in the lengths of the arms being to bring about a quick wide opening of the valve which controls the suction for a slight movement of the member 3, whereby an effective removal of the dust will be obtained whenever the eraser is pressed upon the surface to be cleaned. A spring 13 is provided to normally throw said bell-crank lever into the position shown in solid lines of Fig. 1 wherein the valve is closed, but it is obvious that when the lower member 3 is swung upwardly by pressure applied to its lower surface, the bell-crank lever will be operated to throw the valve member 9 outwardly to open the same. As soon as the pressure on the lower member 3 is released, the spring 13 will restore the parts to close the valve.

The operation of the suction eraser will be clear from the foregoing description. When not in use the valve 9 of the eraser is closed and no suction passes through the eraser. But when anyone grasps the eraser and presses its rubbing surface 4 against the blackboard for erasing the chalk, the valve 9 is immediately opened and the suction begins to act, thus carrying away the chalk dust so as to prevent it from polluting the air of the room.

The sanitary and hygienic advantages of the improvement are obvious.

As shown more particularly in Fig. 4, the present suction eraser is combined with other parts to make the same more efficient for the cleaning of blackboards. In this view, 16 indicates the ordinary blackboard with a chalk rail 17 at the lower side thereof. This chalk rail is made hollow and closed on all sides to form a suction manifold chamber and has a communication with a suction creating means such as a fan 18 through any suitable pipe such as 24. The suction eraser 1 is likewise connected to the hollow chalk rail through its flexible pipe 2, and it is understood that one or more of said suction erasers may be connected to the same chalk rail, only one here being shown. The chalk rail or manifold chamber 17 is further designed with an upper horizontal surface 27 and spaced vertical flanges 25 and 26 such as shown in Fig. 5, forming a recess for chalk which is at least as wide as the suction eraser 1 so that the eraser can lie flat therein with its face down. This enables the chalk rail to be cleaned of chalk dust by sliding the eraser face down along the chalk rail from one end to the other with sufficient downward pressure to open the valve in said eraser. The eraser may have a ring 30 at one end thereof and hooks 31 may be provided on the chalk rail for conveniently hanging said eraser thereto when not in use.

I am aware that many changes and variations may be made in the particular arrangement and parts herein shown, and I do not wish my claims to be limited to the exact embodiment illustrated.

What I claim as new is:—

1. A suction eraser for blackboards comprising, in combination, a hollow elongated casing having two of its elongated sides pressed into the hollow interior to form a hand-grip, and having a third elongated side open, a member movably mounted upon said casing in said opening and substantially filling said opening, said member being provided with a rubbing surface of substantial area and having therein suction dust-receiving openings, suction means so connected to said casing that said bent-in side walls tend to guide the dust to said suction means, a valve in said casing for controlling said suction means, and connections between said valve and said movable member so arranged that pressure upon said rubbing surface opens said valve.

2. A suction eraser for blackboards comprising, in combination, a hollow elongated casing shaped to provide a hand-grip and having one elongated side open, a member movably mounted on said casing in said opening and substantially filling said opening, said member being provided with a rubbing surface of substantial area and having therein suction dust-receiving openings, suction means connected with said casing, a valve in said casing for controlling said suction means, and multiplying connections between said valve and said movable member whereby a small movement of said member under pressure upon said rubbing surface effects a quick, wide opening of said valve.

3. A suction eraser for blackboards comprising, in combination, a hollow elongated casing having one of its elongated sides open and having others bent in to form upon the outside finger grips and upon the inside dust guides, suction means connected with said casing between said dust guides, a member movably mounted upon said casing in said open side and substantially filling said opening, said member being provided with a rubbing surface and having therein suction dust-receiving openings, a valve controlling said suction means, and multiplying connections between said valve and said member so arranged that a small movement of said member under pressure upon said rubbing surface effects a quick, wide opening of said valve whereby a large volume of air is at once drawn through said member whenever said eraser is pressed upon a surface to be cleaned.

4. A suction eraser for blackboards comprising, in combination, a hollow, elongated casing shaped to provide a hand-grip and

having one elongated side formed as an open bottom with guiding walls extending substantially perpendicularly away from said open bottom, a member movably mounted upon said casing in said opening and substantially filling said opening, said member being guided by said walls, being provided with a rubbing surface of substantial area and having therein suction dust-receiving openings, suction means connected with said casing, a valve in said casing for controlling said suction means and multiplying connections between said valve and said movable member whereby a small movement of said member under pressure upon said rubbing surface effects a quick, wide opening of said valve.

5. In a suction eraser for blackboards and the like, in combination, a hollow elongated casing with comparatively long side walls and short end walls, said side walls being formed with the top wall to provide a grip for the hand in supporting said casing, a bottom member movably mounted upon said end walls to close the lower open side of said casing, said bottom member being provided with an opening therethrough communicating with the interior of said casing, rubbing material upon said bottom member adjacent to said opening, a flexible suction tube connected to said casing through one of said narrow end walls, a normally closed valve for controlling the suction through said tube, and means constructed and arranged to be operated by pressure applied to the lower side of said bottom member for effecting a quick, wide opening of said valve for a slight movement of said member.

6. In a suction eraser for blackboards and the like, in combination, a hollow casing, a bottom member therefor movably mounted thereon, said bottom member being provided with an opening therethrough communicating with the interior of said casing, rubbing material upon said bottom member adjacent to said opening, a suction tube connected to said casing and having an opening communicating with the interior thereof, a separate valve member mounted within said casing for to-and-fro movement against said suction tube opening, and means within said casing for causing a slight movement of said bottom member to effect a relatively large movement of said valve member for controlling the suction through said suction tube.

7. In a suction eraser for blackboards and the like, in combination, a hollow casing, a bottom member therefor movably mounted thereon, said bottom member being provided with an opening taherethrough communicating with the interior of said casing, rubbing material upon said bottom member adjacent to said opening, a suction tube connected to said casing and having an opening communicating with the interior thereof, a separate valve member mounted within said casing for to and fro movement against said suction tube opening, a pivoted lever mounted within said casing and having a long arm connected to said valve member and a short arm connected to said bottom member for transmitting the movement of said bottom member to said valve member, and a spring normally acting to keep said valve member closed against said suction tube opening.

8. In a suction eraser for blackboards and the like, in combination, a hollow elongated casing with comparatively long side walls and short end walls, said side walls being formed with the top wall to provide a grip for the hand in supporting said casing, a bottom member movably mounted upon said end walls to close the lower open side of said casing, said bottom member being provided with an opening therethrough communicating with the interior of said casing, rubbing material upon said bottom member adjacent to said opening, a flexible suction tube connected to said casing through one of said end walls and having an opening communicating with the interior of said casing, a separate valve member mounted within said casing for horizontal to and fro movement against said suction tube inlet, a pivoted lever mounted within said casing having one arm connected to said valve member and another arm connected to said bottom member for translating the vertical movement of said bottom member into horizontal movement of said valve member, and a spring normally acting to keep said valve member closed against the opening of said suction tube.

9. The combination with a suction manifold chamber formed with an upper horizontal surface to serve as a chalk rail, of one or more suction erasers each having a flexible suction tube connecting said eraser or erasers with said suction manifold chamber, each of said suction erasers having a valve for controlling the suction therethrough, the horizontal surface of said suction manifold having lateral flanges spaced apart to form a recess at least as wide as said suction eraser so that said suction eraser may lie flat therein face down for cleaning said chalk rail, and means for creating a suction in said suction manifold chamber.

10. In a suction eraser for blackboards and the like in combination, a hollow casing, a bottom member therefor movably mounted thereon, said bottom member being provided with an opening therethrough communicating with the interior of said casing, rubbing material upon said bottom member adjacent said opening, a suction tube con-

nected to said casing and having an opening communicating with the interior thereof, a separate valve member mounted within said casing for to and fro movement against said suction tube opening, a pivoted lever mounted within said casing having one arm connected to said valve member and another arm connected to said bottom member for transmitting the movement of said bottom member to said valve member.

Signed at Olean, N. Y., this 27th day of March 1915.

GEORGE P. LULL.

Witnesses:
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CHRISTOPHER C. BISETT.