

April 28, 1942.

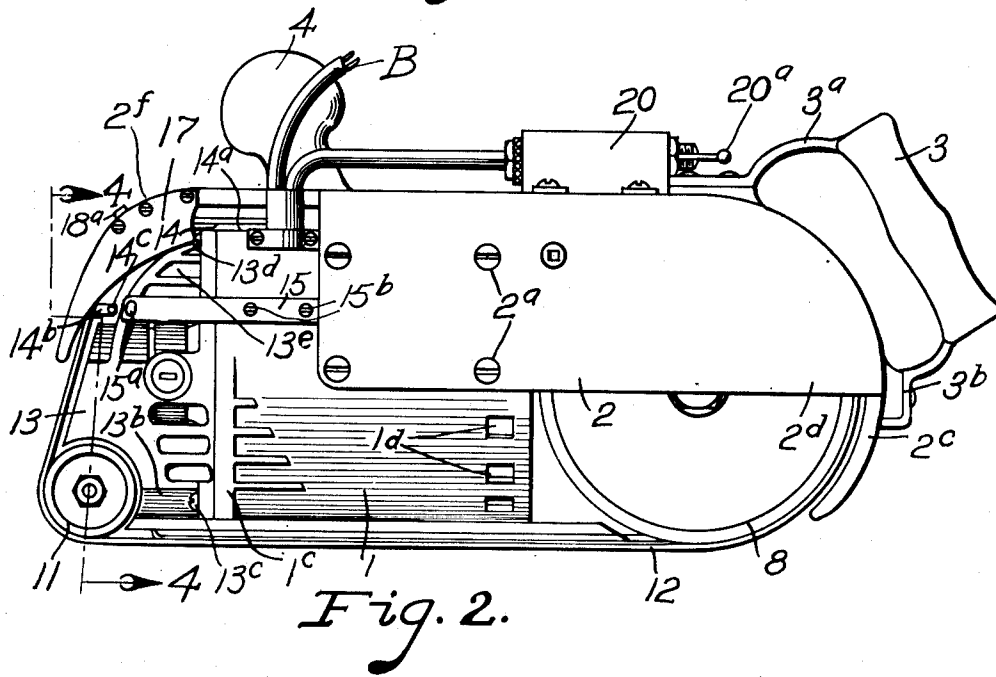
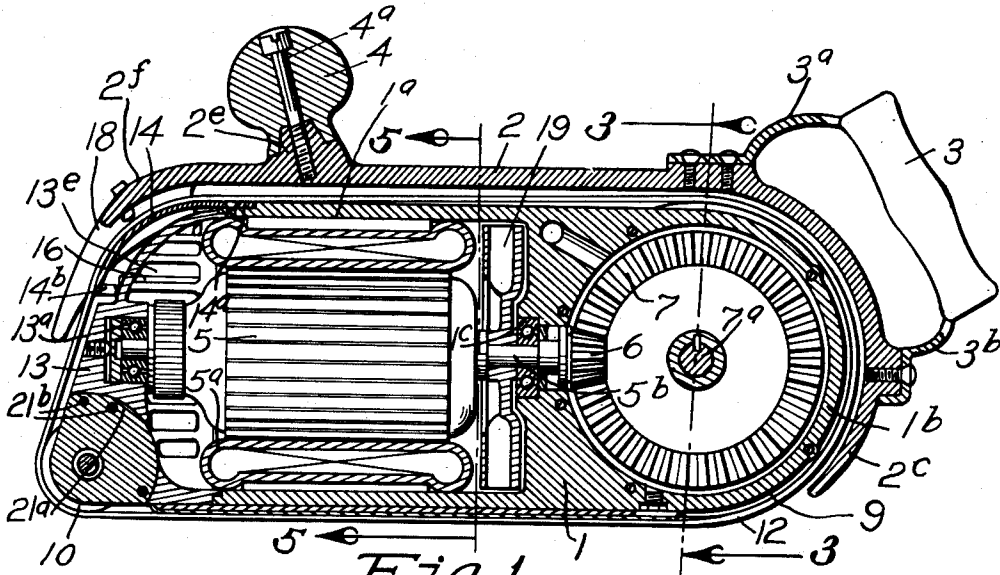
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2,280,867

ABRADING AND BLACKBOARD CLEANING MACHINE

Filed Oct. 30, 1939

2 Sheets-Sheet 1



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2 Sheets-Sheet 2

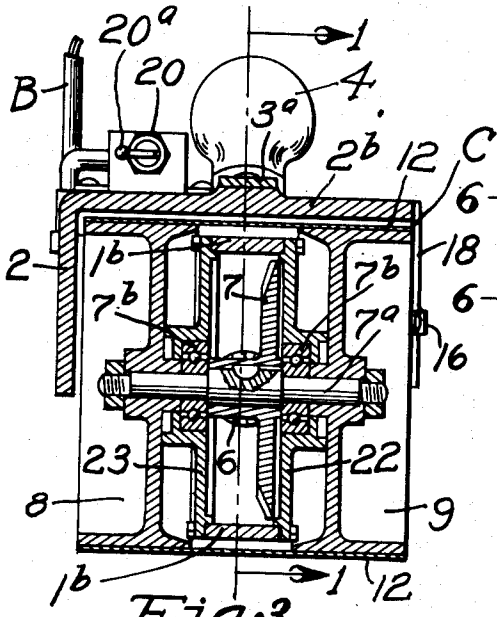


Fig. 3.

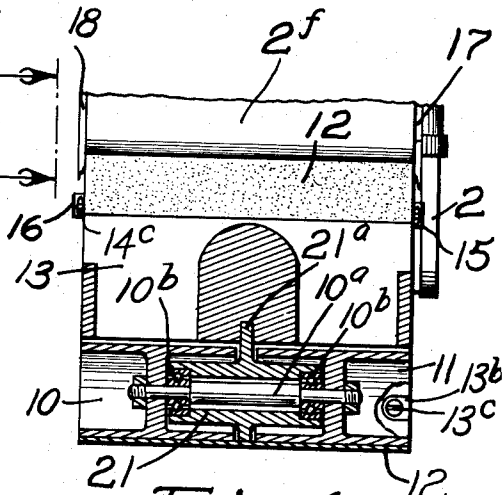


Fig. 4.

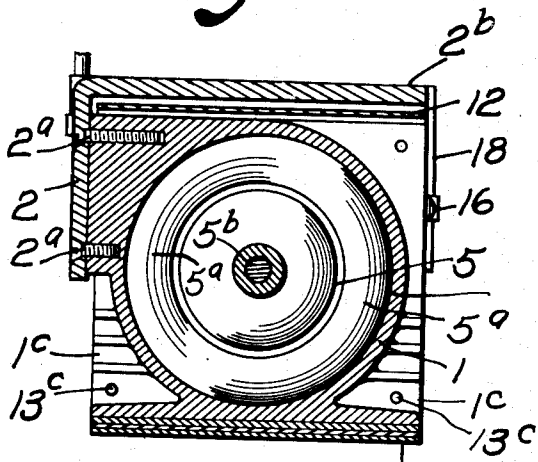


Fig. 5.

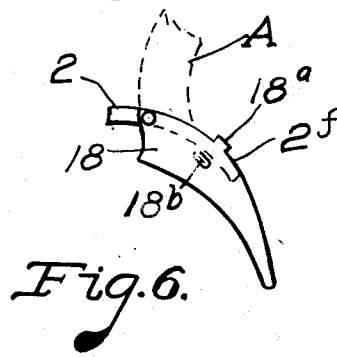


Fig. 6.

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UNITED STATES PATENT OFFICE

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ABRADING AND BLACKBOARD CLEANING MACHINE

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Application October 30, 1939, Serial No. 301,994

9 Claims. (Cl. 51-170)

My invention relates to an abrading and blackboard cleaning machine for surfacing floors or other surfaces and for cleaning blackboards or the like and the objects of my invention are more particularly simplification and improvements upon the structure disclosed in my Letters Patent No. 2,178,865, for abrading and blackboard cleaning machine, issued November 7, 1939, and the principal objects of the simplification improvements are:

First, to provide an abrading and blackboard cleaning machine of this class in which an endless abrasive belt is shiftably supported on only one pair of pulleys at each end and surrounds the motor and driving means of said machine;

Second, to provide an abrading and blackboard cleaning machine of this class in which a relatively small number of parts are used in proportion to its function;

Third, to provide an abrading and blackboard cleaning machine of this class with a relatively large area contact surface in accordance with the size of the machine;

Fourth, to provide a machine of this class in which the tension of the abrasive belt is automatically adjusted;

Fifth, to provide a machine of this class in which the driving pulleys are tangent to the upper and lower side of the machine and are in direct operative relation with the operating motor thereof;

Sixth, to provide a machine of this class with means for keeping the motor cool;

Seventh, to provide a machine of this class which is very compact, light and efficient; and

Eighth, to provide a machine of this class which is very simple and economical of construction in accordance with its efficiency.

With these and other objects in view as will appear hereinafter, my invention consists of certain novel features of construction, combination and arrangement of parts and portions as will be hereinafter described in detail and particularly set forth in the appended claims, reference being had to the accompanying drawings and to the characters of reference thereon which form a part of this application in which:

Figure 1 is a longitudinal sectional view of my abrading and blackboard cleaning machine taken from the line 1-1 of Fig. 3 showing parts and portions in elevation to facilitate the illustration; Fig. 2 is a side elevational view thereof; Fig. 3 is a transverse sectional view taken from the line 3-3 of Fig. 1 showing parts and portions in elevation to facilitate the illustration and

also showing a portion broken away and in section; Fig. 4 is a fragmentary transverse sectional view taken from the line 4-4 of Fig. 2 showing parts and portions in elevation to facilitate the illustration; Fig. 5 is a transverse sectional view taken from the line 5-5 of Fig. 1 showing parts in elevation to facilitate the illustration; and Fig. 6 is a fragmentary elevational view taken from the line 6-6 of Fig. 4 showing by dash lines a varying position of a belt guide of the machine.

Similar characters of reference refer to similar parts and portions throughout the several views of the drawings:

The main casing 1, casing and belt guard 2, operating handle 3, guide handle 4, armature 5, bevel pinion 6, bevel gear 7, drive pulleys 8 and 9, front pulleys 10 and 11, abrasive belt 12, casing member 13, spring plate 14, spring plate latch members 15 and 16, belt guide members 17 and 18, fan 19, switch 20, bearing casing 21 and the bearing casing members 22 and 23 constitute the principal parts and portions of my abrading and blackboard cleaning machine.

The main casing 1 is a shell like casing provided with a hollow cylindrical portion 1a at its one end and is provided with a gear casing portion 1b at its other end. Revolvably mounted in the main casing portion 1a is an armature 5 which is surrounded by an armature field 5a in the conventional manner. The armature shaft 5b is supported at one end in the ball bearing 13a positioned in the casing member 13 and is supported at its opposite end in the ball bearing 1c positioned in the main casing 1. Mounted on the armature shaft 5b intermediate the armature 5 and the bearing 1c is the fan 19. The bevel pinion is mounted on the end of the armature shaft 5b and is arranged to mesh with the bevel gear 7 which is mounted on the drive shaft 7a, which is substantially at a right angle to the shaft 5b, as shown best in Figs. 1 and 3 of the drawings. This drive shaft 7a is supported in the ball bearings 7b which are mounted in the bearing casing members 22 and 23. Mounted on opposite ends of the drive shaft 7a are the drive pulleys 8 and 9.

Secured to the one side of the main casing 1 is the casing and belt guard 2 by means of the bolts 2a, as shown best in Figs. 2 and 5 of the drawings. This casing and belt guard 2 is provided with an angularly extending portion 2b which is arranged in spaced relation to the upper side of the main casing 1 permitting free passage of the abrasive belt 12 therebetween. It is also provided at its one end with a curved portion 2c which is

arranged in slight spaced relation with the drive pulleys 8 and 9 and is integral with the skirt portion 2d, as shown in Fig. 2 of the drawings. Mounted on the rear end of this casing and belt guard 2 by means of the brackets 3a and 3b is the operating handle 3.

The guide handle 4 is mounted on the upper side of the casing and belt guard 2 near its front portion by means of the bolt 4a which is screw threaded in the upwardly extending lug portion 2e on the casing and belt guard 2. The front pulleys 10 and 11, as shown best in Figs. 2 and 4, are mounted on the axle shaft 10a which is supported in bearings 10b in the bearing casing 21.

The abrasive belt 12 is arranged to fit over the drive pulleys 8 and 9, the spring plate 14 and the front pulleys 10 and 11. The casing member 13 is arranged to support the front pulleys 10 and 11 by means of the upwardly extending portion 21a of the bearing casing 21 which is held securely therein by means of bolts 21b, as shown best in Figs. 1 and 4 of the drawings. This casing member 13 is secured to the flange portion 1c of the main casing 1 by means of bolts 13c and 13d in the recess portions 13b of the member 13.

The spring plate 14 is mounted on the upper side of the main casing 1 at its end portion 14a. This spring plate 14 is resilient and is substantially the width of the belt 12 and tends to keep the belt 12 under tension at all times.

Secured on one end of the spring plate 14 is a bar portion 14b which is provided with reduced portions 14c at its opposite ends which are arranged to engage the holes 15a of the spring plate latch members 15 and 16 when the belt 12 is being removed or replaced.

The spring plate latch members 15 and 16 are secured to the main casing 1 by means of the bolt 15b as shown best in Fig. 2 of the drawings. The belt guide members 17 and 18 are secured on opposite edges of the front portion 2f of the casing and belt guard 2. These members 17 and 18 extend downwardly from the portion 2f at opposite edges of the belt 12. It will be noted that the belt guide member 18 is hinged at its one end and is secured intermediate its ends by means of the clip portion 18a over one side edge of the casing portion 2f and a detent portion 18b opposing said portion 18a at the opposite side of the casing portion 2f, as shown best in Fig. 6. The belt guide member 18 may be shifted into the dash line position, as indicated at A in Fig. 6 of the drawings, the detent portion 18b being forced over the edge of the portion 2f when shifted to said position A.

The fan 19, being mounted on the armature shaft 5b, is adapted to circulate air around the armature 5 and force the air outwardly through the openings 1d of the main casing 1. It will be noted that air is permitted to enter through the openings 13e in the casing 13 at the forward end of the armature 5.

The bearing casing members 22 and 23 are mounted on opposite sides of the casing portion 1b of the main casing 1 and are arranged to encase the pinion 6 and gear 7 and support the bearings 7b on the shaft 7a.

The operation of my abrading and blackboard cleaning machine is substantially as follows: The electric conductor B is connected to a power supply and the switch 20 in connection therewith is arranged to close or break the circuit in connection with the armature 5. When it is desired to operate my abrading machine, the op-

erator grasps the operating handle 3 in one hand and the guide handle 4 in the other hand and starts the armature 5 to revolve by means of the switch handle 20a, the belt 12 being mounted on the pulleys 8, 9, 10 and 11 and the spring plate 14 passes around said pulleys and spring plate in a counterclockwise direction, as shown in Fig. 1 of the drawings. The lower surface of the machine is then placed on any surface which it is desired to finish and the machine may be moved accordingly by means of the handles 3 and 4.

It will be noted that the ratio derived from the pinion 6 and gear 7 provides sufficient power on the drive pulleys 8 and 9 to permit the use of considerable pressure on the machine when abrading surfaces.

The belt guides 17 and 18 hold the belt 12 in proper alignment with the pulleys 10 and 11 and the spring plate 14 automatically compensates for any stretching of the belt 12.

When it is desired to remove the belt 12 from the machine, the spring plate 14 is pressed inwardly toward the spring plate latch members 15 and 16 and the extending portions 14c thereof engage the slotted portions 15a of the latch members 15 and 16, thereby holding the spring plate 14 in spaced relation from the belt 12. The thumb screw 18a is removed from the portion 2f of the casing 2 and the belt guide member 18 is shifted to the dash line position A, as shown in Fig. 6 of the drawings. The belt is then readily removed from one side of the machine C as indicated in Fig. 3 of the drawings.

Though I have shown and described a particular construction, combination and arrangement of parts and portions, I do not wish to be limited to this particular construction, combination and arrangement, but desire to include in the scope of my invention the construction, combination and arrangement substantially as set forth in the appended claims.

Having thus described my invention, what I claim as new and desire to secure by Letters Patent is:

1. In an abrading and blackboard cleaning machine of the class described, the combination of a hollow shell like casing, a motor mounted therein at one end with its axis longitudinally thereof, a drive shaft in connection with one end of said motor extending backwardly therefrom, a bevel pinion on the extended end of said drive shaft, a bevel gear centrally positioned in the rear portion of said casing and intermeshing with said bevel pinion, a shaft for said bevel gear extending in opposite directions therefrom, a drive pulley secured on each end of said shaft outwardly of said casing with the surfaces of said pulleys extending to the upper and lower sides and beyond the rear end portion of said casing, and a single endless abrasive belt positioned over said pulleys and around said casing and contacting with said pulleys whereby said abrasive belt is driven by said pulleys said casing enclosing said motor and the gear driving means.

2. In an abrading and blackboard cleaning machine of the class described, the combination of a hollow shell like casing, a motor mounted therein at one end with its axis longitudinally thereof, a drive shaft in connection with one end of said motor extending backwardly therefrom, a bevel pinion on the extended end of said drive shaft, a bevel gear centrally positioned in the rear portion of said casing and intermeshing with said bevel pinion, a shaft for said bevel

gear extending in opposite directions therefrom, a drive pulley secured on each end of said shaft outwardly of said casing with the surfaces of said pulleys extending to the upper end lower sides and beyond the rear end portion of said casing, a single endless abrasive belt positioned over said pulleys and around said casing and contacting with said pulleys whereby said abrasive belt is driven by said pulleys said casing enclosing said motor and the gear driving means, and a separate casing and belt guard secured in spaced relation to said abrasive belt.

3. In an abrading and blackboard cleaning machine of the class described, the combination of a hollow shell like casing, a motor mounted therein at the front portion with its axis longitudinally thereof, a drive shaft in connection with one end of said motor extending backwardly therefrom, a bevel pinion on the extended end of said drive shaft, a bevel gear centrally positioned in the rear portion of said casing and intermeshing with said bevel pinion, a shaft for said bevel gear extending in opposite directions therefrom, a drive pulley secured on each end of said shaft with the surfaces of said pulleys extending to the upper and lower sides and beyond the rear end portion of said casing, a single abrasive belt positioned over said pulleys and around said casing and contacting with said pulleys whereby said abrasive belt is driven by said pulleys, a separate casing and belt guard secured in spaced relation to said abrasive belt, and automatic tension means in engagement with the upper front side of said abrasive belt supported by said casing.

4. In an abrading and blackboard cleaning machine of the class described, the combination of a hollow shell like casing, a motor mounted therein at the front portion with its axis longitudinally thereof, a drive shaft in connection with one end of said motor extending backwardly therefrom, a bevel pinion on the extended end of said drive shaft, a bevel gear centrally positioned in the rear portion of said casing and intermeshing with said bevel pinion, a shaft for said bevel gear extending in opposite directions therefrom, a drive pulley secured on each end of said shaft with the surfaces of said pulleys extending to the upper and lower sides and beyond the rear end portion of said casing, a single abrasive belt positioned over said pulleys and around said casing and contacting with said pulleys whereby said abrasive belt is driven by said pulleys, a separate casing and belt guard secured in spaced relation to said abrasive belt, automatic tension means in engagement with the upper front side of said abrasive belt supported by said casing, and means for guiding the side edges of said belt on said spring tension means.

5. In an abrading and blackboard cleaning machine of the class described, the combination of an elongated hollow shell like casing with a transverse curved partition forming a circular compartment at the rear end thereof, a motor mounted in the front end thereof with its axis longitudinally of said casing, a shaft for said motor extending backwardly substantially centrally of said casing to near the front side of said circular compartment, a bevel pinion on the extended end of said shaft, a bevel gear intermeshing with said bevel pinion, a shaft for said bevel gear extending in opposite directions laterally of said casing centrally of said circular compartment, a pair of drive pulleys mounted on said shaft, one on each side of said bevel gear with

their surfaces extending to the upper and lower sides and beyond the rear portion of said casing, and a single abrasive belt mounted tightly on said pulleys whereby said abrasive belt is driven, said belt extending around the outer side of said casing.

6. In an abrading and blackboard cleaning machine of the class described, the combination of an elongated hollow shell like casing with a transverse curved partition forming a circular compartment at the rear end thereof, a motor mounted in the front end thereof with its axis longitudinally of said casing, a shaft for said motor extending backwardly substantially centrally of said casing to near the front side of said circular compartment, a bevel pinion on the extended end of said shaft, a bevel gear intermeshing with said bevel pinion, a shaft for said bevel gear extending in opposite directions laterally of said casing centrally of said circular compartment, a pair of drive pulleys mounted on said shaft, one on each side of said bevel gear with their surfaces extending to the upper and lower sides and beyond the rear portion of said casing, a single abrasive belt mounted tightly on said pulleys whereby said abrasive belt is driven, said belt extending around the outer side of said casing, and a separate casing and belt guard secured in spaced relation to said abrasive belt at its upper and rear side, said rear side being wholly arcuate.

7. In an abrading and blackboard cleaning machine of the class described, the combination of an elongated hollow shell like casing with a transverse curved partition forming a circular compartment at the rear end thereof, a motor mounted in the front end thereof with its axis longitudinally of said casing, a shaft for said motor extending backwardly substantially centrally of said casing to near the front side of said circular compartment, a bevel pinion on the extended end of said shaft, a bevel gear intermeshing with said bevel pinion, a shaft for said bevel gear extending in opposite directions laterally of said casing centrally of said circular compartment, a pair of drive pulleys mounted on said shaft, one on each side of said bevel gear with their surfaces extending to the upper and lower sides and beyond the rear portion of said casing, a single abrasive belt mounted tightly on said pulleys whereby said abrasive belt is driven, said belt extending around the outer side of said casing, a separate casing and belt guard secured in spaced relation to said abrasive belt at its upper and rear side, said rear side being wholly arcuate, and means secured to opposite sides of said casing for guiding said belt.

8. In an abrading and blackboard cleaning machine of the class described, the combination of a hollow shell like casing, a motor mounted therein at one end with its axis longitudinally thereof, a drive shaft in connection with one end of said motor extending therefrom, a pinion on the extended end of said drive shaft, a gear centrally positioned in another end portion of said casing and intermeshing with said pinion, a shaft for said gear extending in opposite directions therefrom, a drive pulley secured on each end of said shaft outwardly of said casing with the surfaces of said pulleys extending to the upper and lower sides and beyond the end portion of said casing and an endless abrasive belt positioned over said pulleys and around said casing and contacting with said pulleys whereby said abrasive belt is driven by said pulleys, said cas-

ing enclosing said motor and the gear driving means.

9. In an abrading machine of the class described, the combination of a hollow shell-like casing, a motor mounted therein at one end thereof with its axis longitudinally of said casing, a drive shaft in connection with one end of said motor extending therefrom, a pinion on the extending end of said drive shaft, a gear centrally positioned in another end portion of said casing and intermeshing with said pinion, a shaft

for said gear extending in opposite directions therefrom, a drive pulley on each end of said shaft outwardly of said casing with the surfaces of said pulleys extending to the upper and lower side and beyond the end portion of said casing and an endless abrasive belt positioned over and contacting said pulleys and positioned around said casing and shiftably removable from said pulleys at one side of said casing whereby said abrasive belt is shifted sideways from said pulleys.

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