Aug. 20, 1935. W. S. JOHNSON 2,011,973

FLOOR CLEANER

Filed Feb. 20, 1933 2 Sheets-Sheet 1

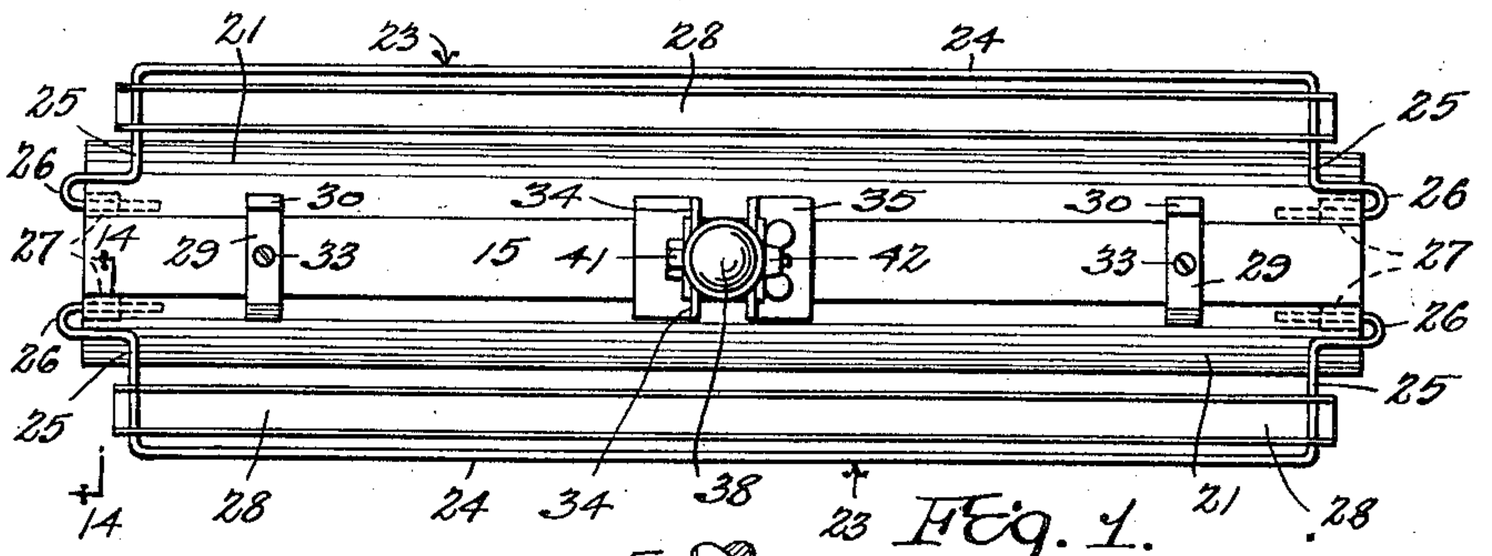


Fig. 1.

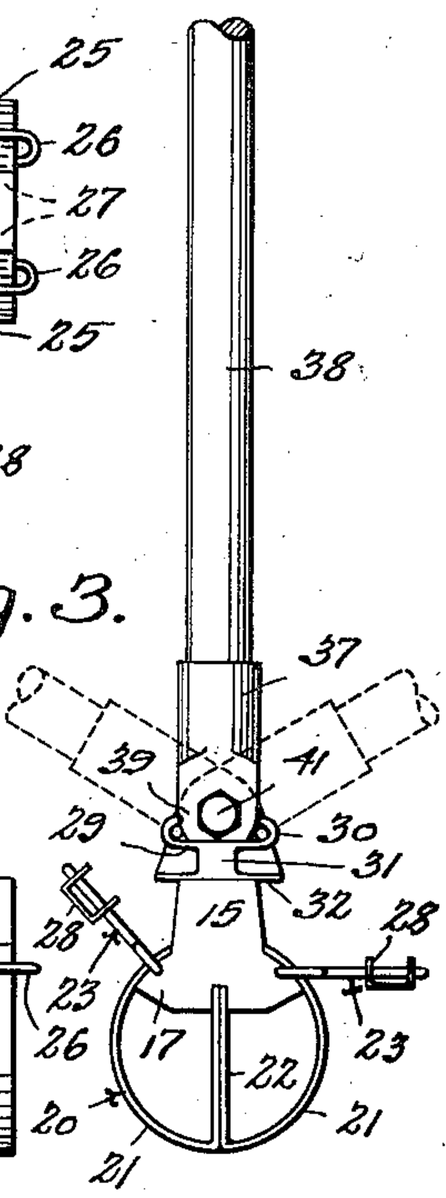


Fig. 3.

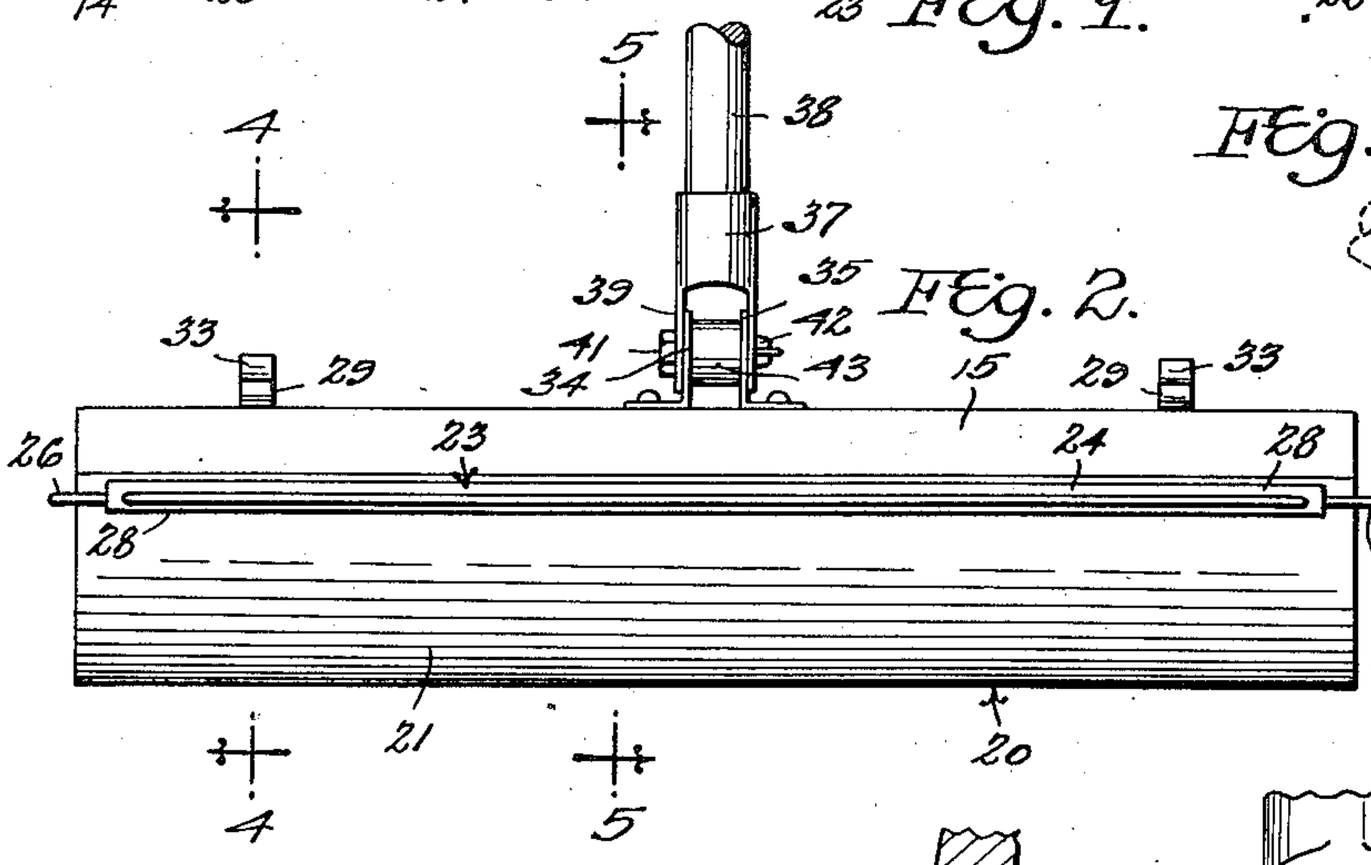


Fig. 2.

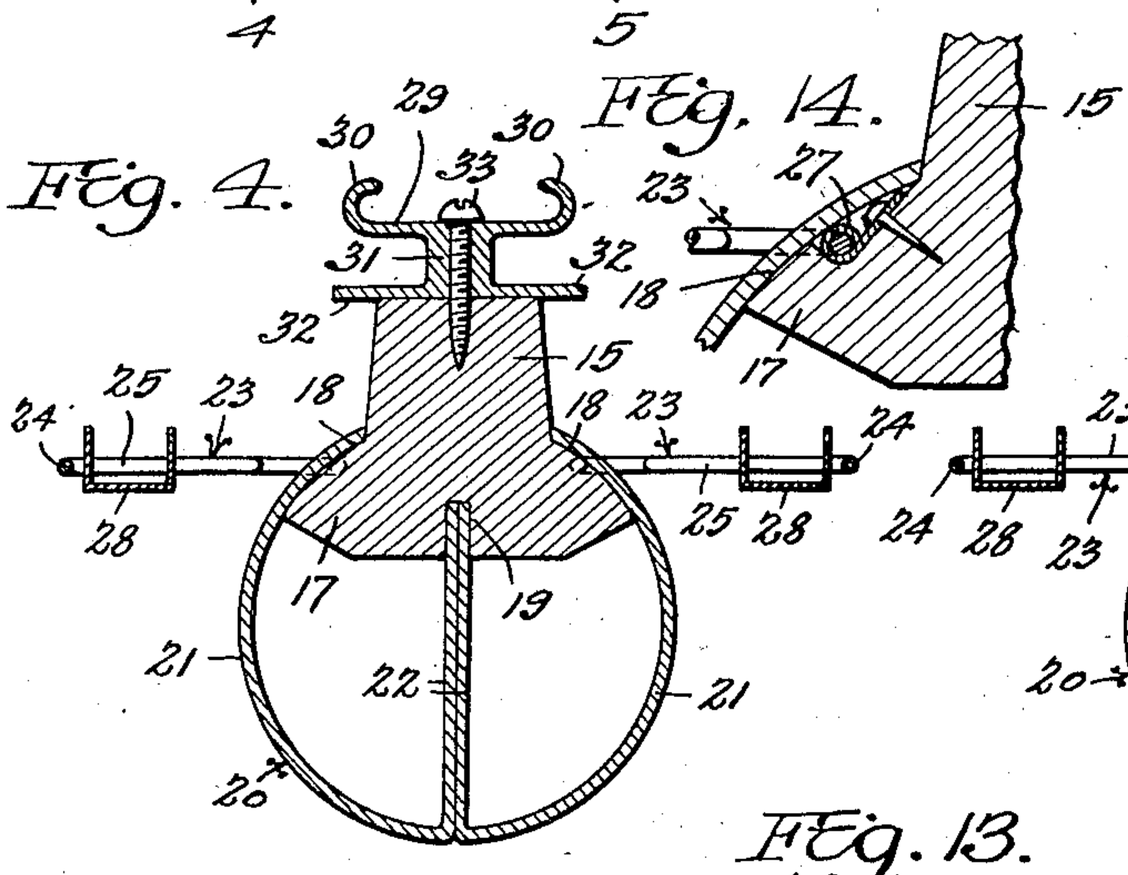


Fig. 4.

Fig. 14.

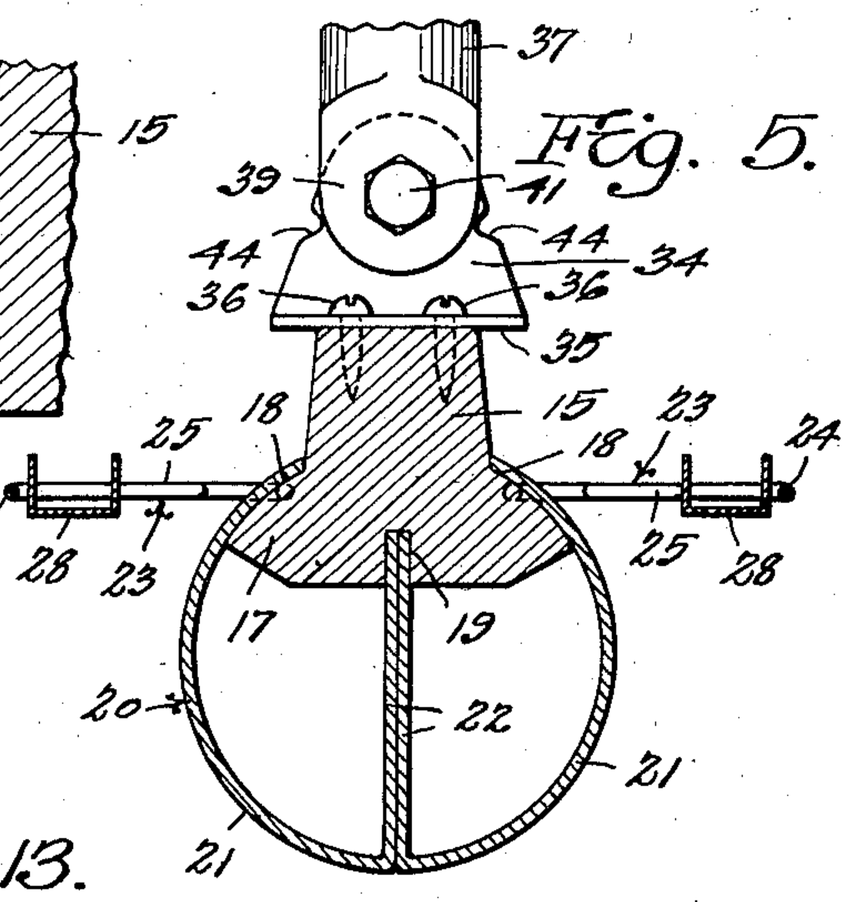
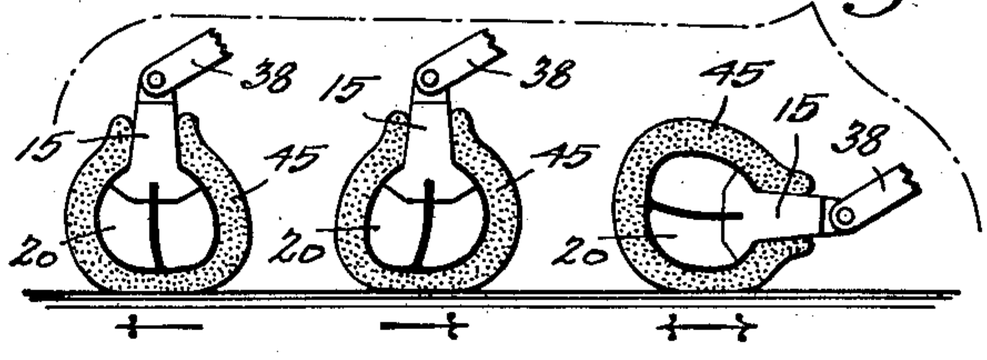


Fig. 5.

Fig. 13.



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FLOOR CLEANER

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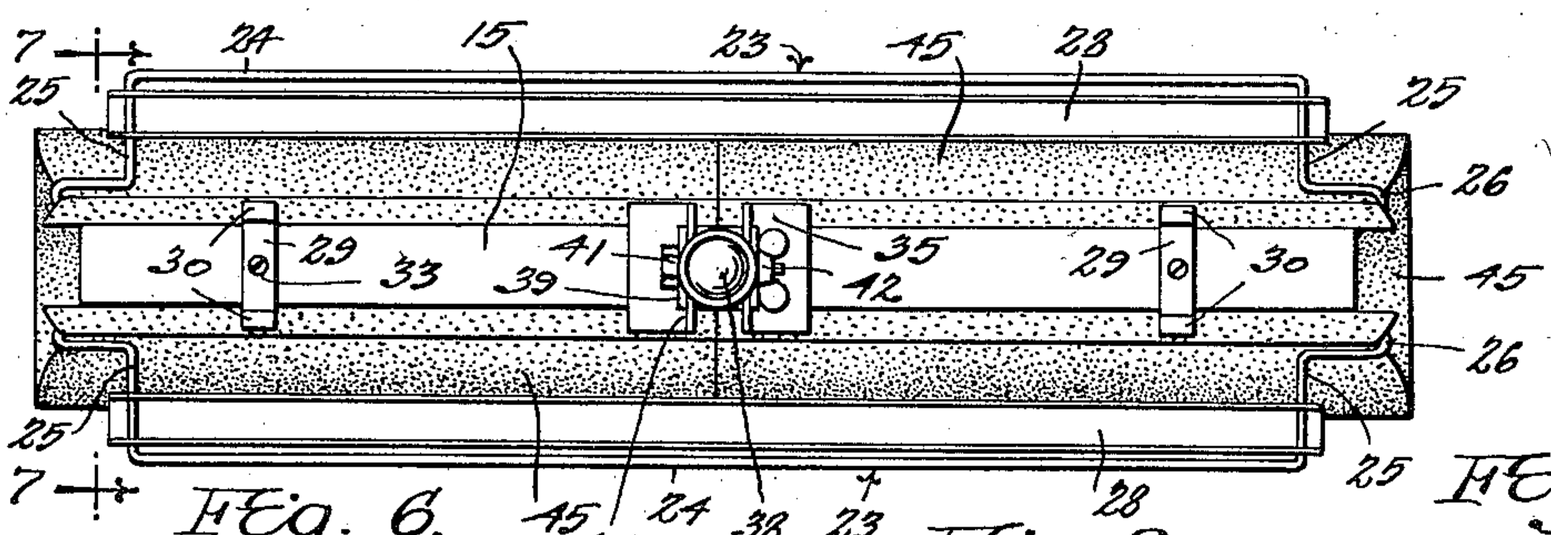

Fig. 6.

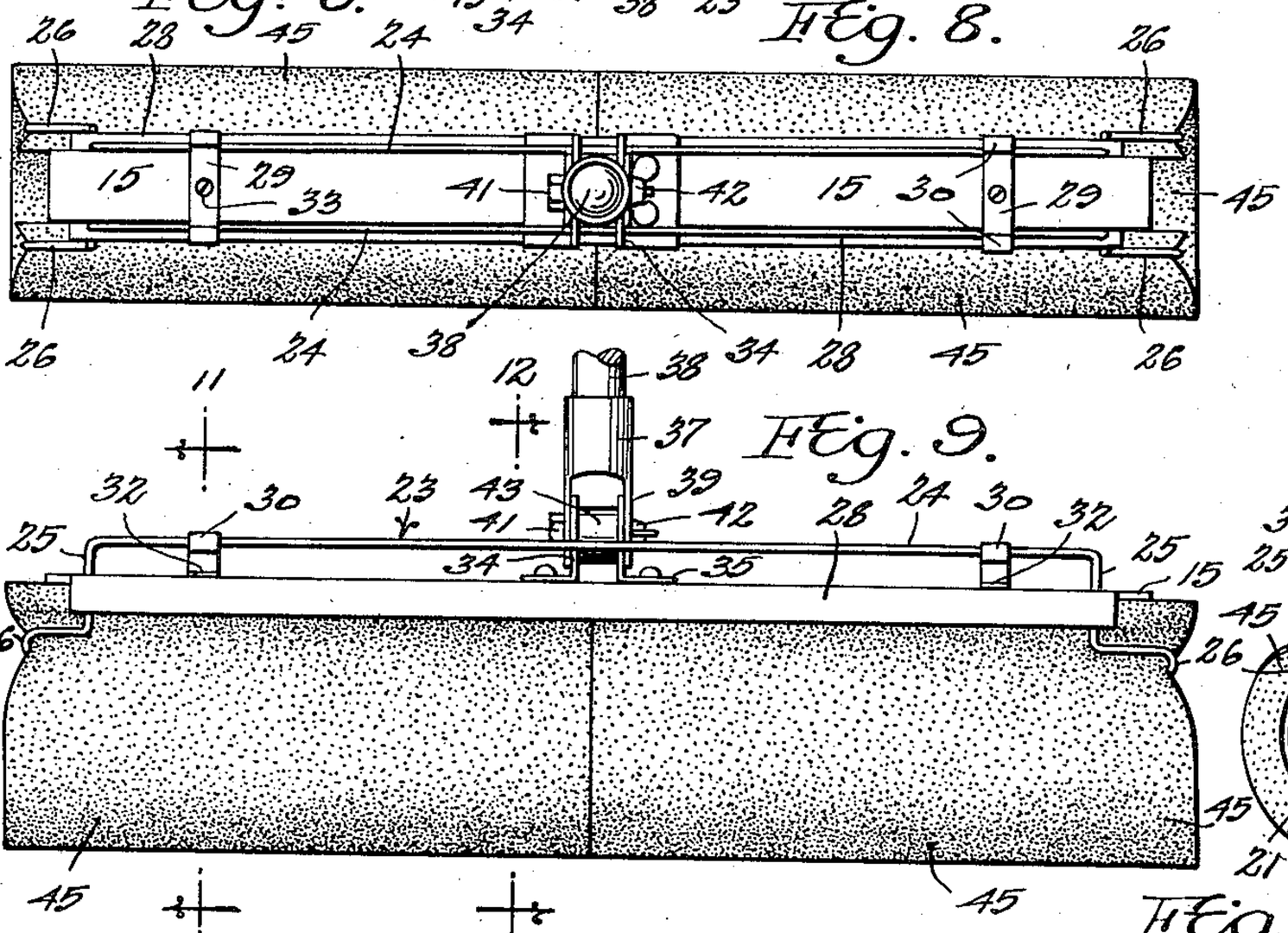

Fig. 8.

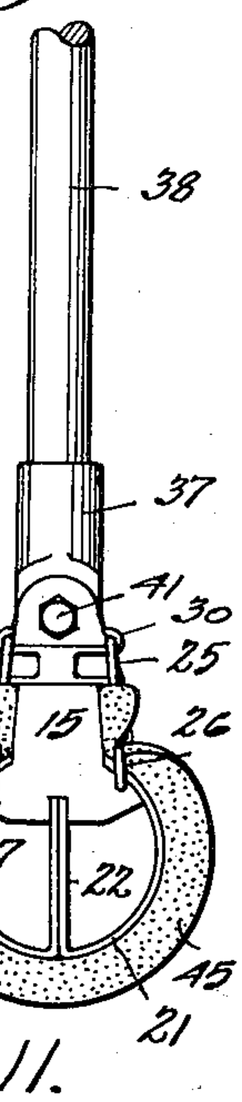

Fig. 10.

Fig. 9.

Fig. 11.

Fig. 12.

Fig. 7.

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UNITED STATES PATENT OFFICE

2,011,973

FLOOR CLEANER

William S. Johnson, Boise, Idaho

Application February 20, 1933, Serial No. 657,710

10 Claims. (Cl. 15—231)

My invention relates to cleaning devices.

An important object of the invention is to provide a device of the above-mentioned character, which may be used for cleaning hard or soft wood floors which may be waxed, varnished, painted or enameled, linoleums, or other similar floor coverings, and also floors of tile, marble, cement, and other hard surfaces.

A further object of the invention is to provide a cleaning device of the above-mentioned character, so constructed that it has the maximum range in use and the two faces of the cleaning element may be brought into operation by turning the device over in the hand, bringing the top surface of the cleaning element in contact with the floor.

A further object of the invention is to provide a device of the above-mentioned character, so constructed that an effective application of the cleaning element is obtained with wide part or face contact to surface being cleaned, by flexing the hollow core.

A further object of the invention is to provide a device of the above-mentioned character, which may be effectively used, in any position wherein the handle may be adjusted to various radial positions.

A further object of the invention is to provide a cleaner of the above-mentioned character which may be employed for sweeping and mopping the floors, for removing dirt, hair, or similar substances which cling to the surface of the cleaning element, which may be subsequently easily removed therefrom by the use of a whisk broom or brush.

A further object of the invention is to provide a cleaning element which will absorb fine particles of dust by the vacuum action of the pores or cells of the same, and which may be readily removed by washing the cleaning element with soap and water.

Other objects and advantages of the invention will be apparent during the course of the following description.

In the accompanying drawings, forming a part of this specification, and in which like numerals are employed to designate like parts throughout the same,

Figure 1 is a plan view of a cleaning device embodying my invention, the cleaning element being removed and the holding elements in the open position,

Figure 2 is a side elevation of the same,

Figure 3 is an end elevation of the same,

Figure 4 is a transverse section taken on line 4—4 of Figure 2,

Figure 5 is a similar view taken on line 5—5 of Figure 2,

Figure 6 is a plan view of the device with the cleaning element applied thereto and the holding elements in the open position,

Figure 7 is a transverse section taken on line 7—7 of Figure 6.

Figure 8 is a view similar to Figure 6, with the holding elements in the closed position,

Figure 9 is a side elevation of the device with the holding elements in the closed position,

Figure 10 is an end elevation of the same,

Figure 11 is a transverse section taken on line 11—11 of Figure 9,

Figure 12 is a similar view, taken on line 12—12 of Figure 9,

Figure 13 is a diagrammatic view illustrating the flexed positions of the device, and

Figure 14 is a detail section through the knuckle taken on line 14—14 of Figure 1.

In the drawings, wherein for the purpose of illustration is shown a preferred embodiment of my invention, the numeral 15 designates a core, formed of wood or the like. This core has a forward enlarged portion 17, provided with rear convex portions 18, which are circularly curved in cross-section. The enlarged portion 17 is provided at its forward side with a longitudinal groove 19. The numeral 20 designates a head, which is cylindrical or circular in cross-section. This head is formed of material which is suitably stiff and resilient, such as sheet fibre, sheet metal, or the like. The head 20 comprises two sections 21, and the rear edges of these sections 21 are mounted upon the convex faces 18, and are attached thereto by any suitable means, such as cement, or the like. At their forward edges the sections 21 are bent inwardly, forming normally straight strips 22 arranged in contacting relation, and having their rear edges extending into the groove 19 and held therein by any suitable means, such as by cement or the like. These straight strips 22 have their contacting faces free from connection with each other, thereby providing the desired flexibility.

The numeral 23 designates holding elements which are resilient and are preferably formed of wire of suitable stiffness. Each holding element is generally U-shaped and includes a side 24 and ends 25. The ends 25 are bent to provide inwardly facing U-shaped extensions 26, the inner ends of these extensions being pivotally mounted within knuckles 27, attached to the en-

larged portion 17 of the head 15, at the convex faces 18 thereof, as shown. Each holding element 23 carries a clamping element or rail 28, in the form of a channel, and is thereby U-shaped in cross-section, with its open side arranged inwardly. The rail or channel is provided in its opposite sides with apertures for slidably receiving the ends 25, whereby the rail is shiftable transversely with respect to the holding element 23.

Means are provided to hold the elements 24 in the closed position, comprising transverse plates 29, provided at its opposite ends with upstanding curved lips 30. The transverse plates are mounted upon spacing elements 31, which in turn, are carried by lower transverse plates 32, the entire unit being attached to the head 15 by a screw 33, or the like. The lower plates 32 project beyond the sides of the head 15, for a substantial distance, as shown.

Means are provided to connect a handle with the head 15, comprising a pair of spaced plates 34, having plates or bases 35 attached to their lower ends, and these plates 35 project beyond the opposite faces of the head 15, for a substantial distance, as more clearly shown in Figure 5. The plates or bases 35 are rigidly attached to the head 15 by screws 36, or the like.

The numeral 37 designates a ferrule or socket receiving a handle 38, and this ferrule is equipped with apertured knuckles 39 adapted to be arranged upon the outer sides of the plates or knuckles 34, which are also apertured, the two sets of knuckles being pivotally connected by means of a bolt 41 carrying a winged nut 42, or the like. The spacing sleeve 43 is arranged upon the bolt 41, and is disposed between the inner knuckles 34. By proper manipulation of the winged nut 42, the handle 38 may be locked to the head 15 in a selected adjusted angular position, or the handle may have free swinging pivotal connection. The plates or knuckles 34 have their edges converging rearwardly, and these edges have notches 44 to receive the sides 24 of the holding elements.

The numeral 45 designates cleaning element sections, which, when assembled, produce a cleaning element carried upon the core 21. This cleaning element may be formed of sponge rubber, or other suitable material. Each cleaning element is preferably a square, and this enables the same to be mounted four ways upon the core, for increasing capacity and longer life.

In applying the cleaning elements to the core 20, both holding elements 23 being in the open position, at substantially a right angle to their closed position, when cleaning element section 45 has its end presented to the holding element 23, the outer corner of the cleaning element is pulled through the U-shaped extension 26, the entire end of the cleaning element being then passed into the holding element and beneath the clamping rail 28, which has previously been shifted to the outer position. The companion cleaning element section is placed in position in a similar manner, and when the two cleaning element sections have been properly assembled upon the core 21, in substantial alignment with each other, the rail 28 being shifted to the inner position, the holding element 23 is now swung inwardly, bringing the clamping rail 28 into holding engagement with the end portions of the cleaning elements, Figures 11 and 12. When the holding element is swung inwardly, the side 24 thereof rides over the upwardly curved or projecting lips 30, and will spring in behind them, the intermediate portion of the side 24 engaging within the notches 44. In a similar manner, the opposite ends of the cleaning elements 45 are arranged within the holding element and clamped thereto upon the head 15. When it is desired to remove the cleaning element sections, the side 24 of the holding element is sprung inwardly and upwardly to clear the locking ribs 30, when the holding element may be swung outwardly.

With the cleaning element sections assembled upon the resilient core 20, such cleaning elements may be properly moved or rubbed over the surfaces to be cleaned. The core 20 being normally cylindrical, the cleaning element sections will be normally held in a corresponding shape. However, when it is desired to increase the area of contact between the cleaning element sections and the surface to be cleaned, pressure is exerted upon the handle 38, which pressure is transmitted to the resilient core 20, causing this core to be flexed and thereby have the contact portion thereof flattened. The strips 22 may flex in either direction, depending upon the application of pressure, as shown in Figure 13. Further, the sides of the cleaning element sections may be brought into engagement with the surfaces to be cleaned, and suitable pressure applied, thereby flexing the sides of the core 20 and producing the increased area by virtue of the flattened portions.

The U-shaped extensions 26 serve to hold the corners of the cleaning element sections, and also compress these corners and become properly embedded in the material of the same, whereby they are covered and prevented from contacting with furniture, or the like. These extensions also permit of the head 15 being shortened, thereby allowing the cleaning element sections to project longitudinally beyond the same for a substantial distance, keeping the head from contacting with objects. The cleaning element is preferably formed in two sections, but the invention is in no sense restricted to this feature. By employing the cleaning element sections, they may be more conveniently manipulated and readily reversed so that their opposite faces may be used.

It is to be understood that the form of my invention herewith shown and described is to be taken as a preferred example of the same, and that various changes in the shape, size and arrangement of parts may be resorted to without departing from the spirit of my invention, or the scope of the subjoined claims.

Having fully described my invention, what I claim as new is:—

1. A cleaning device comprising a head provided with a groove, a hollow resilient core embodying sections, said sections having corresponding ends attached to the head at opposite sides of the groove and its opposite ends bent inwardly to produce sheets having their free edges held within the groove, a cleaning element mounted upon the core, and means to hold the cleaning element upon the core.

2. A cleaning device comprising a head having convex faces arranged upon opposite sides of the head, a substantially cylindrical core provided with longitudinal edge portions and having said edge portions attached to the convex faces, a radially extending sheet arranged within the core and secured thereto and to the head, a cleaning element mounted upon the substantially

cylindrical core, and means to retain the cleaning element upon the core.

3. A cleaning device comprising a head having oppositely arranged side faces, a core carried by the head and projecting forwardly beyond the same, a cleaning element arranged upon the core with its ends engaging the faces, generally U-shaped resilient holding elements arranged upon opposite sides of the head and pivoted thereto and having means for engagement with the cleaning element when the holding elements are swung rearwardly to a position substantially parallel with said faces, and plates disposed near the rear edge of the head and secured to the head and having locking extensions for detachable engagement with the holding elements when the holding elements are swung to the rear position.

4. A cleaning device comprising an elongated head having oppositely arranged side faces, a cleaning element carried by the head and having edges, generally U-shaped holding elements disposed upon opposite sides of the head and adapted to be swung to a rear closed position, each holding element embodying a side and ends, said ends having U-shaped extensions to receive the edges of the cleaning element, said extensions being pivotally connected with the head and extending longitudinally beyond the same, the holding elements being adapted to engage with the cleaning element and hold the cleaning element against the oppositely arranged faces of the head when the holding elements are swung to the rear closed position, and means to hold the holding elements in the closed position.

5. A cleaning device comprising an elongated head having oppositely arranged side faces, a cleaning element extending forwardly of the rear edge of the head and carried by the head and engaging the faces and having edges, generally U-shaped holding elements disposed upon opposite sides of the head, each holding element embodying a side and ends, said ends having U-shaped extensions to receive the side edges of the cleaning element, said extensions being pivotally connected with the head, the holding elements being adapted to engage with the cleaning element when the holding elements are shifted rearwardly to a position substantially parallel with the faces, an attaching plate arranged at the rear edge of the head and secured to the head between its ends, means for pivotally connecting a handle with the attaching plate, and plates secured to the head at its rear edge and upon opposite sides of the first-named plate and having upstanding locking extensions, the sides of the holding elements being adapted to engage with the upstanding extensions and with the attaching plate.

6. A cleaning device comprising an elongated head having oppositely arranged side faces, a core carried by the head and projecting forwardly beyond such faces, cleaning element sections mounted upon the core and having their ends engaging the oppositely arranged faces, generally U-shaped holding elements arranged upon opposite sides of the head and pivotally connected therewith and having U-shaped extensions to receive the side edges of the cleaning element sections, said holding elements being shiftable rearwardly to a closed position substantially parallel with said faces, clamping rails mounted upon the holding elements and shiftable transversely thereof, the rails engaging with the cleaning element when the holding elements are shifted to the rear position, and means to hold the holding elements in the closed position.

7. A cleaning device comprising a head having oppositely arranged faces and a forward projection provided with oppositely arranged curved surfaces, a hollow cylindrical core provided with opposite longitudinal edge portions and disposed forwardly of the head and having said edge portions attached to the curved surfaces, a cleaning element mounted upon the core and having its ends disposed to engage with the opposite faces of the head, holding elements disposed upon opposite sides of the head and having their forward ends pivotally connected with the head near the forward end of the head and having parts to engage with the cleaning element and force the same toward the opposite faces of the head when the holding elements are swung rearwardly to a position substantially parallel with the oppositely arranged faces, and means to lock the holding elements in the rear position.

8. A cleaning device comprising a head having oppositely arranged faces and a forward projection provided with oppositely arranged sides, a hollow cylindrical core provided with longitudinal edge portions and disposed forwardly of the head and having said edge portions attached to the sides, a cleaning element mounted upon the core and having its ends disposed to engage with the opposite faces of the head, holding elements disposed upon opposite sides of the head and having their forward ends pivotally connected with the head near the forward end of the head, clamping rails mounted upon the holding elements and adjustable transversely thereof and adapted to engage with the ends of the cleaning element and force the same against the opposite faces of the head when the holding elements are swung rearwardly to a position substantially parallel with the faces of the head, and means to secure the holding elements in the rear position.

9. A cleaning device comprising a head having oppositely arranged side faces and a forward face, said forward face being provided with a groove, a resilient hollow core disposed forwardly of the head and having rear edge portions secured to the side faces and also having supported means arranged therein and held within the groove, a cleaning element mounted upon the core, and means to retain the cleaning element upon the core.

10. A cleaning device comprising a head having a forward face provided with a groove, a resilient hollow core disposed forwardly of the head and attached to the head and also having supporting means arranged therein and held within the groove, a cleaning element mounted upon the core, and means to retain the cleaning element upon the core.

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