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SAND BLAST CABINET

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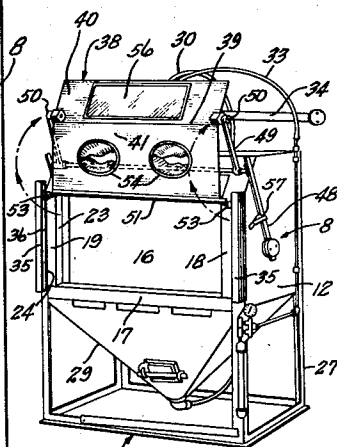
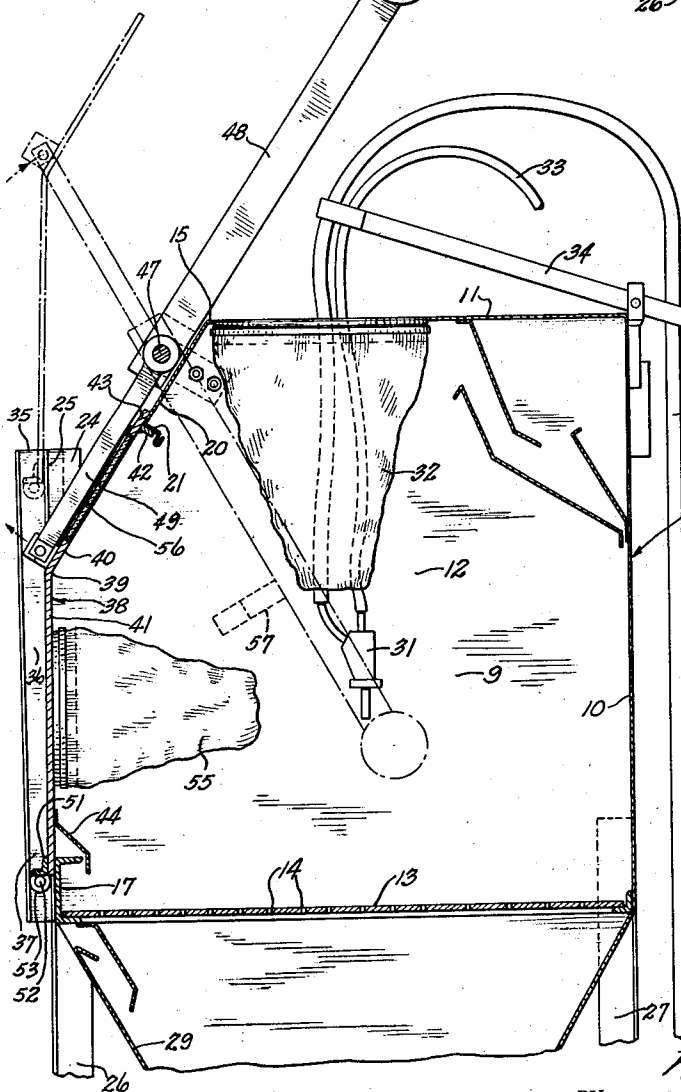
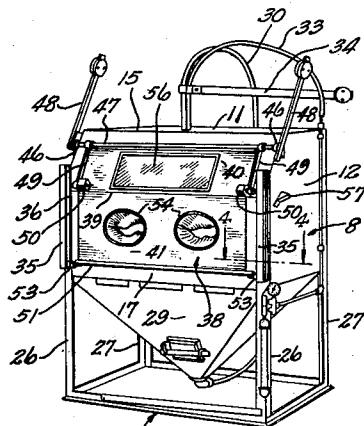
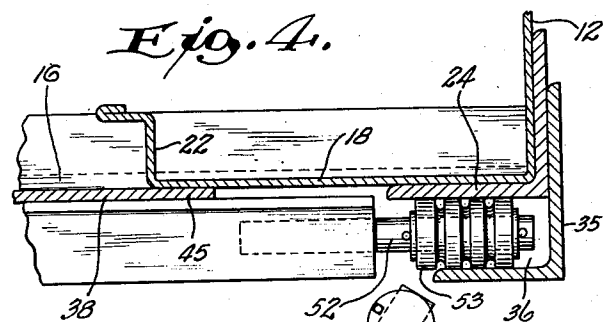


*Fig. 3.*

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## UNITED STATES PATENT OFFICE

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## SANDBLAST CABINET

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15 Claims. (Cl. 51-8)

This invention relates to improvements in sand blast cabinets.

Cabinets of the type with which the present invention is concerned are employed during the process of cleaning castings or other articles by the use of a sand blast. In my prior Patent No. 1,601,147 there is described a cabinet constructed with a swingable front door. This door includes an angularly disposed upper portion containing a sight window and a vertically disposed lower portion provided with a suspended slitted apron of flexible material through which the sand blast nozzle is inserted. The angular disposition of the upper portion of the door is desirable so that the operator may have a better view of the work. However, the hinged joint heretofore considered necessary between the upper and lower portions of the door is objectionable as it permits leakage of sand to the outside, thereby impairing the health of the operator. Furthermore, the use of the slitted apron also permits the escape of too much sand.

It is a general object of the present invention to provide an improved sand blast cabinet having a door wherein the vertically disposed lower portion connects rigidly with the angularly disposed upper portion instead of being hinged thereto, said two portions being preferably of one-piece construction and so arranged as to provide a door which forms a tight seal when closed, which is easily opened by a vertical lifting movement, and which occupies a minimum of head room when raised. Heretofore the collapsibility afforded by the hinged joint between the upper and lower portions of the door, when the latter is raised, has been considered necessary to conserve head room and to provide for easy opening of the door.

A further object of the invention is to provide a sand blast cabinet wherein the door is supported in a novel manner for opening movement to facilitate manipulation thereof, to conserve head room and floor space, and to provide for a tight seal against the escape of sand when the door is closed.

A further object of the invention is to provide a sand blast cabinet having an upwardly movable door, wherein the upper portion of the door is pivoted adjacent its edges to the outer ends of levers so that the upper portion of the door is swingable in an arc between said levers, the lower portion of the door being guided for movement in a substantially vertical direction closely adjacent the front of the cabinet.

A more specific object of the invention is to

provide a cabinet door construction as above described wherein the lower edge of the door is permanently guided in a vertical track, said track being arranged to form a wedging closure when the door is in lowered position.

A further specific object of the invention is to provide in a sand blast cabinet of the class described counterbalanced arms which are so connected to the door as to provide for easy manipulation without interfering with the vertical guide for the lower edge of the door.

Other objects of the invention are to provide a sand blast cabinet wherein the lower portion of the door may be equipped with flexible gauntlets; wherein there is quick access to the blasting chamber; wherein the operator has a clear view of the work; and wherein the operator can accurately control the nozzle while being completely protected from sand and dust.

With the above and other objects in view the invention consists of the improved sand blast cabinet, and all its parts and combinations as set forth in the claims, and all equivalents thereof.

In the accompanying drawing illustrating one complete embodiment of the preferred form of the invention, in which the same reference numerals designate the same parts in all of the views:

Fig. 1 is a perspective view of the improved sand blast cabinet with the door in closed position;

Fig. 2 is a similar view illustrating the door in raised position;

Fig. 3 is an enlarged vertical sectional view of the cabinet, the lower portion being broken away; and

Fig. 4 is a fragmentary sectional view on a still more enlarged scale taken approximately on the line 4-4 of Fig. 1.

Referring more particularly to the drawing, the upper portion of the cabinet is designated generally by the numeral 8 and forms an enclosure for the blasting chamber 9. The upper portion includes a rear wall 10, a top wall 11, and end walls 12. The bottom of the blasting chamber is formed by a blasting table 13 provided with perforations 14.

The top of the cabinet terminates at 15, a substantial distance rearwardly from the extreme front. The front of the cabinet is equipped with an opening 16 bounded by a bottom channel 17, by side marginal portions 18 and 19, and by a top marginal portion 20. The lower edge of the top marginal portion 20 is flanged inwardly as at 21, and the inner edges of the side marginal

portions 18 and 19 are flanged inwardly as at 22 and 23. Secured to each of the side walls and fitted on the front corners of the cabinet are vertically disposed angles 24 which project above the rearwardly inclined front portion as at 25. These angles extend downwardly to form front legs 26.

Other angles 27 secured to the rear corners of the cabinet extend downwardly to form rear legs, and the angles 26 and 27 are connected to a supporting base 28.

Below the perforated floor 13 of the blasting chamber is a sand hopper 29 which is connected by a hose 30 with a sand nozzle 31 within the blasting chamber. The sand nozzle extends through a flexible roof bellows 32 in a position where it can be grasped by the operator. An air hose 33 also leads to the nozzle 31. Both the sand hose 30 and air hose 33 are supported in suspended position from the end of a counterbalanced lever 34.

Angles 35 which overlap the sides of the upper portions of the angles 24 as illustrated in Fig. 4 and which have their front portions spaced from the front portions of the angles 24 form guiding channels or tracks 36. The angles 35 are preferably welded in position at a slight angle so that the channels 36 are increasingly narrow near the lower ends, as at 37.

A one-piece door designated generally by the numeral 38 fits over the opening 16 in the front of the cabinet. This door is preferably formed of metal and preferably has its upper portion bent angularly rearwardly on the line 39 to divide the door into an angularly disposed upper portion 40 and a vertically disposed lower portion 41. Near the upper edge of the door on the inner side thereof is an inwardly projecting flange 42 which fits against the flange 21 of the door frame when the door is closed to provide a sand-tight seal, the frame being overlapped on the exterior by the extreme upper edge portion 43 of the door. Attached to the inner side of the door near the lower edge is a shielding strip 44 which overlaps the channel 17 when the door is closed to further prevent the escape of sand. The side edges of the door overlap the side marginal portions 18 and 19 of the door frame as at 45 when the door is closed (see Fig. 4).

Secured to the upper portions of the cabinet are bearings 46 within which a horizontal rock shaft 47 is journaled. To the extreme ends of this shaft are rigidly secured counterbalanced arms 48. Door operating levers 49 have their upper ends rigidly connected to the rock shaft 47 and have their lower ends pivotally connected to the door as at 50 adjacent the line of bend 39 in the door. The pivots 50 constitute the only connection between the upper portion of the door and the cabinet. In my prior patent, No. 1,601,147, the door is pivotally connected to the cabinet at its extreme upper edge, and this door is hinged along a line corresponding to the line 39 of the present invention so that the lower portion of the door folds into collapsed position when raised. Due to the unique mounting of the present door the objectionable hinged joint, which permits the escape of sand, has been eliminated.

Secured to the lower edge of the door is an angle strip 51 which projects beyond the side edges of the door and which carries projecting studs 52. These studs in turn carry rollers 53 which operate in the side channels or guides 36. As shown by the dotted lines in Fig. 3, the diameter of the rollers 53 is slightly less than the width

of the channel near the upper end. As the rollers are lowered, however, they become slightly wedged in the lower portion of the channel, as shown by full lines in Fig. 3, to cause pressing of the door tightly in closed position. The wedging action, however, is not enough to interfere with easy manipulation of the door.

The lower portion 41 of the door is formed with two arm openings 54, and each arm opening is formed with inwardly extending flexible gauntlets 55 through which the arms of the operator may be extended.

In use of the cabinet, the casting or other article to be cleaned is placed on the blasting table 12 and the door is lowered to the position of Fig. 1. This is accomplished by pulling downwardly on the bottom angle 51 of the door. The operator then stands in front of the cabinet with his arms extending through the gauntlets 55. He then grasps the nozzle 31 and causes the sand blast to be directed against the work. While blasting, the sight window 56 in the upper portion 40 of the door affords a clear view of the work.

When it is desired to remove the work, the door 38 may be quickly raised by pulling upwardly on the lower angle 51. During such manipulation the bottom rollers 53 ride straight upwardly in the tracks 36. The upper portion of the door, however, is immediately swung outwardly on an arc following the course of the arrows in Fig. 2. At the upper portion of the arc the door operating arms 48 pull the upper portion of the door inwardly again, as shown in Fig. 2. When the door is in fully raised position the counterbalanced arms 48 engage side stops 57.

It is apparent from Fig. 2 that the door when in raised position occupies a minimum of head room in spite of the fact that there is no hinged joint between the sight window section and the gauntlet section. It is also apparent that the door-operating arrangement is such as to provide an extremely tight seal when the door is in closed position. Such a seal is of major importance in an article of this type because the purpose of these cabinets is to protect the worker from breathing sand dust.

While the features of this invention are particularly desirable in a door having an angularly bent upper portion, it is obvious that the invention is also applicable to straight doors. Various other changes and modifications may be made without departing from the spirit of the invention, and all of such changes are contemplated as may come within the scope of the claims.

What I claim is:

1. In a sand blast cabinet, a casing for receiving an article to be cleaned and having a front opening, a door for closing said opening, means for guiding the lower portion of the door during opening and closing movement to cause said portion to move approximately straight upwardly and downwardly close to the front of the casing, the door being pivotal on the horizontal axis of said guided portion, spaced levers pivotally connected at their inner ends to the casing and at their outer ends to upper side portions of the door so that the upper portion of the door may swing between said levers when the door is operated, said levers being so positioned as to cause the upper portion of the door to move in an arc forwardly and upwardly and then rearwardly while the lower portion of the door is being moved straight upwardly in an approximately vertical direction.

2. In a sand blast cabinet, a casing for receiving an article to be cleaned and having a front

opening, a door for closing said opening, upright tracks on the casing adjacent the side edges of the door, means on the lower portion of the door engageable with said tracks to guide the lower portion of the door during movement thereof, the door being pivotal on the horizontal axis of said guiding means, spaced levers pivotally connected at their inner ends to the casing and at their outer ends to upper side portions of the door so that the upper portion of the door may swing between said levers when the door is operated, said levers being so positioned as to cause the upper portion of the door to move in an arc forwardly and upwardly and then rearwardly while the lower portion of the door is being moved straight upwardly in an approximately vertical direction.

3. In a sand blast cabinet, a casing for receiving an article to be cleaned and having a front opening, a door for closing said opening, upright channels on the casing adjacent the side edges of said door, rollers projecting from lower side portions of the door and engageable within said channels to guide the lower portion of the door during movement thereof, the door being pivotal on said rollers, spaced levers pivotally connected at their inner ends to the casing and at their outer ends to upper side portions of the door so that the upper portion of the door may swing between said levers when the door is operated, said levers being so positioned as to cause the upper portion of the door to move in an arc forwardly and upwardly and then rearwardly while the lower portion of the door is being moved straight upwardly in an approximately vertical direction.

4. In a sand blast cabinet, a casing for receiving an article to be cleaned, said casing having a front wall which includes a lower portion and a rearwardly inclined upper portion, and there being an opening in said front wall which extends into both the upper and lower portions thereof, a door having a rearwardly inclined upper portion rigidly connected to the lower portion of said door for closing said opening, and spaced levers pivotally connected at their inner ends to the casing and at their outer ends to the sides of the door a substantial distance below the upper edge of said door, the upper portion of the door being swingable in an arc between said levers upwardly and then forwardly and then rearwardly.

5. In a sand blast cabinet, a casing for receiving an article to be cleaned, said casing having a front wall which includes a lower portion and a rearwardly inclined upper portion, and there being an opening in said front wall which extends into both the upper and lower portions thereof, a door having a rearwardly inclined upper portion rigidly connected to the lower portion of said door for closing said opening, spaced levers pivotally connected at their inner ends to the casing and at their outer ends to the sides of the door a substantial distance below the upper edge of said door, the upper portion of the door being swingable in an arc between said levers upwardly and then forwardly and then rearwardly, and means for vertically guiding the lower portion of the door during movement thereof while permitting the door to pivot on the horizontal axis of said guided portion.

6. In a sand blast cabinet, a casing for receiving an article to be cleaned, said casing having a front wall which includes a lower portion and a rearwardly inclined upper portion, and there being an opening in said front wall which extends into both the upper and lower portions thereof, a door having a rearwardly inclined upper por-

tion rigidly connected to the lower portion of said door for closing said opening, spaced levers pivotally connected at their inner ends to the casing and at their outer ends to the sides of the door a substantial distance below the upper edge of said door, the upper portion of the door being swingable in an arc between said levers upwardly and then forwardly and then rearwardly, upright tracks on the casing adjacent the side edges of said door, and means on the lower portion of the door engageable with said tracks to guide said lower portion during movement of the door, the door being pivotal on the horizontal axis of said last means.

7. In a sand blast cabinet, a casing for receiving an article to be cleaned, said casing having a front wall which includes a lower portion and a rearwardly inclined upper portion, and there being an opening in said front wall which extends into both the upper and lower portions thereof, a door having a rearwardly inclined upper portion rigidly connected to the lower portion of said door for closing said opening, spaced levers pivotally connected at their inner ends to the casing and at their outer ends to the sides of the door a substantial distance below the upper edge of said door, the upper portion of the door being swingable in an arc between said levers upwardly and then forwardly and then rearwardly, upright channels on the casing adjacent the side edges of said door, and rollers projecting from lower side portions of the door and engageable within said channels, the door being pivotal on said rollers.

8. In a sand blast cabinet, a casing for receiving an article to be cleaned, said casing having a front wall which includes a lower portion and a rearwardly inclined upper portion, and there being an opening in said front wall which extends into both the upper and lower portions thereof, a door having a rearwardly inclined upper portion rigidly connected to the lower portion of said door for closing said opening, spaced levers pivotally connected at their inner ends to the casing and at their outer ends to the sides of the door a substantial distance below the upper edge of said door, the upper portion of the door being swingable in an arc between said levers upwardly and then forwardly and then rearwardly, upright channels on the casing adjacent the side edges of said door, and rollers projecting from lower side portions of the door and engageable within said channels, the door being pivotal on said rollers, said channels being of gradually diminishing width toward the bottom thereof to cause pressing of the lower portion of the door into tight sealing position when closed.

9. In a sand blast cabinet, a casing for receiving an article to be cleaned, said casing having a front wall which includes a lower portion and a rearwardly inclined upper portion, and there being an opening in said front wall which extends into both the upper and lower portions thereof, a rigid door for closing said opening having a rearwardly inclined upper portion integral with the lower portion of said door, and spaced levers pivotally connected at their inner ends to the casing and at their outer ends to the sides of the door a substantial distance below the upper edge of said door, the upper portion of the door being swingable in an arc between said levers first upwardly and forwardly and then rearwardly.

10. In a sand blast cabinet, a casing for receiving an article to be cleaned, said casing having a front wall which includes a lower portion

and a rearwardly inclined upper portion, and there being an opening in said front wall which extends into both the upper and lower portions thereof, a door having a rearwardly inclined upper portion rigidly connected to the lower portion of said door for closing said opening, a rock shaft extending horizontally above the door opening, bearings on the casing within which said rock shaft is journaled, levers rigidly connected at their upper ends to said rock shaft and pivotally connected at their lower ends to side edges of the door a substantial distance below the upper edge of said door, the upper portion of the door being swingable in an arc between said levers first upwardly and forwardly and then rearwardly, and a counterbalanced arm connected to an end of said rock shaft and projecting in the opposite direction from said levers.

11. In a sand blast cabinet a casing for receiving an article to be cleaned and having a front opening, a door for closing said opening, spaced levers pivotally connected at their inner ends to the casing and at the outer ends to upper side portions of the door so that the door may swing between said levers, said levers being so positioned as to cause the upper portion of the door to move in an arc forwardly and upwardly and then rearwardly.

12. In a sand blast cabinet a casing for receiving an article to be cleaned and having a front opening, a door for closing said opening, spaced levers pivotally connected at their inner ends to the casing and at the outer ends to upper side portions of the door so that the door may swing between said levers, said levers being so positioned as to cause the upper portion of the door to move in an arc forwardly and upwardly and then rearwardly, upright channels on the casing adjacent the side edges of said door, and rollers on the lower portion of the door engageable within said channels to guide the lower portion of the door during movement thereof, said channels being of gradually decreasing width toward the bottom thereof to cause pressing of the lower portion of the door into tight sealing position when the door is closed.

13. In a sand blast cabinet, a casing for receiving an article to be cleaned, said casing having a front wall which includes a lower portion and a rearwardly inclined upper portion, and there being an opening in said front wall which extends into both the upper and lower portions thereof, a door having a rearwardly inclined upper portion rigidly connected to the lower portion of said door for closing said opening, a sight window in said rearwardly inclined upper portion of

the door, means for guiding the lower portion of the door during opening and closing movement to cause said portion to move approximately straight upwardly and downwardly close to the front of the casing to form a tight seal against the front when closed, the door being pivotal on the horizontal axis of said guided portion, and spaced levers pivotally connected at their inner ends to the casing and at their outer ends to the sides of the door a substantial distance below the upper edge of said door, the upper portion of the door being swingable in an arc between said levers upwardly and forwardly and then rearwardly.

14. In a sand blast cabinet, a casing for receiving an article to be cleaned, said casing having a front wall which includes a lower portion and a rearwardly inclined upper portion, and there being an opening in said front wall which extends into both the upper and lower portions thereof, a door having a lower portion provided with arm openings and having a rearwardly inclined upper portion rigidly connected to the lower portion of said door for closing said opening, a sight window in said rearwardly inclined upper portion of the door, means for guiding the lower portion of the door during opening and closing movement to cause said portion to move approximately straight upwardly and downwardly close to the front of the casing to form a tight seal against the front when closed, the door being pivotal on the horizontal axis of said guided portion, and spaced levers pivotally connected at their inner ends to the casing and at their outer ends to the sides of the door a substantial distance below the upper edge of said door, the upper portion of the door being swingable in an arc between said levers upwardly and forwardly and then rearwardly.

15. In a sand blast cabinet, a casing for receiving an article to be cleaned and having a front opening, a door for closing said opening, means for guiding the lower portion of the door during opening and closing movement to cause said portion to move approximately straight upwardly and downwardly close to the front of the casing, the door being pivotal on the horizontal axis of said guided portion, and levers pivotally connected at their inner ends to the casing and pivotally connected at their outer ends to an upper portion of the door, the upper edge of the door being free of the casing, and said levers being so positioned and pivoted as to cause said upper edge to move in an arc forwardly and upwardly away from the door opening, and then rearwardly, while the lower portion of the door is being moved straight upwardly in an approximately vertical direction.

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