

May 10, 1960

W. H. MEAD

2,935,820

AIR-SOLIDS SEPARATION SYSTEM FOR BLAST ROOM

Filed Oct. 22, 1957

6 Sheets-Sheet 1

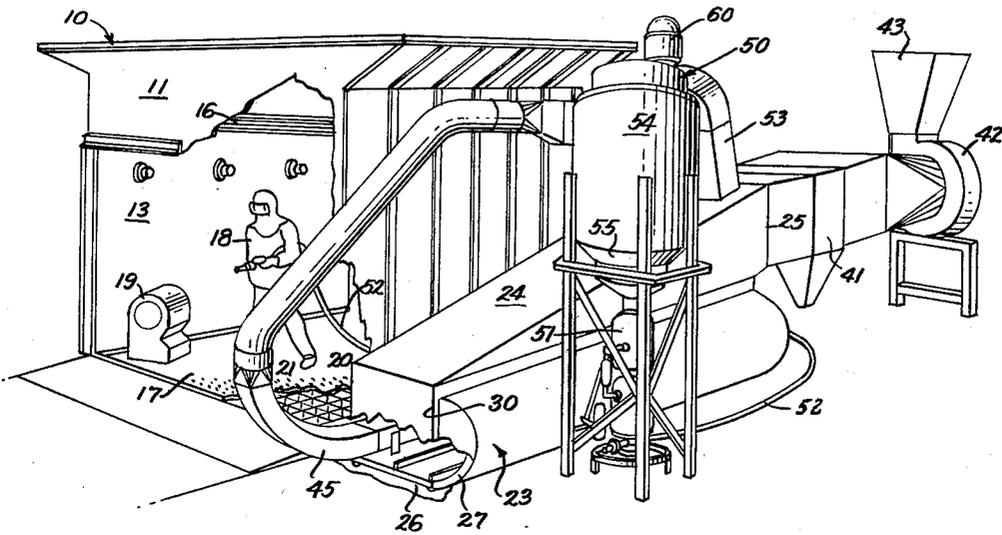


Fig. 1.

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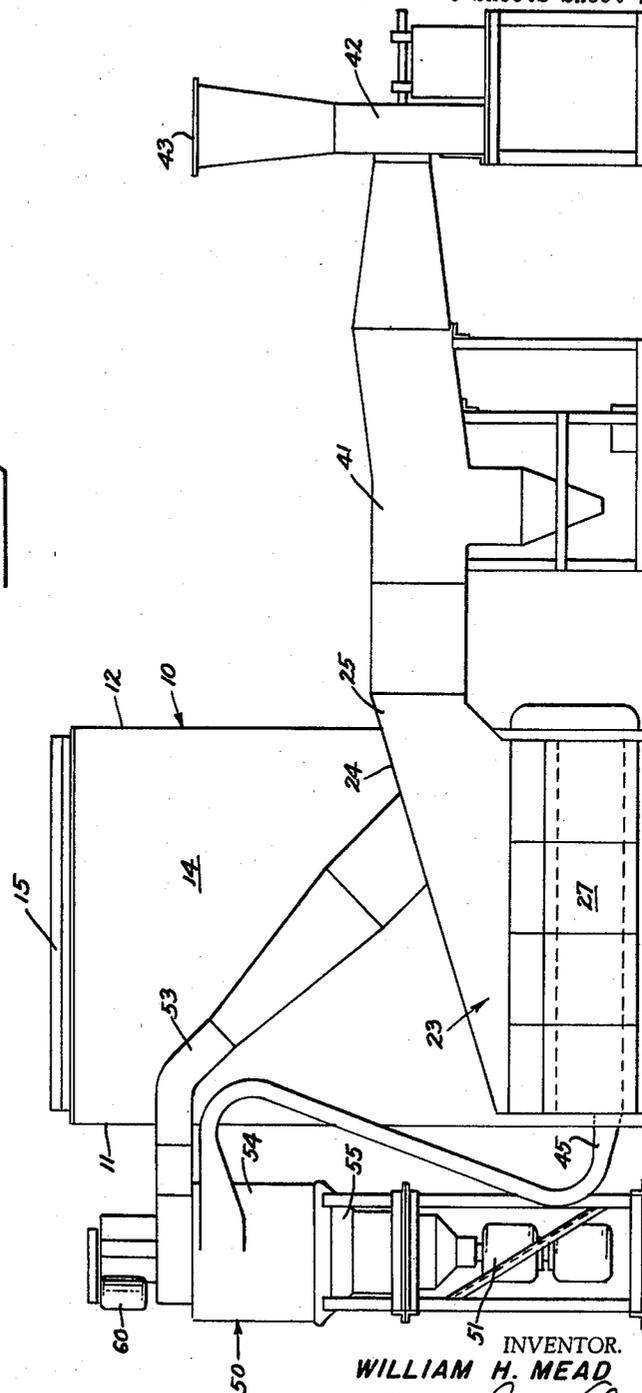
2,935,820

AIR-SOLIDS SEPARATION SYSTEM FOR BLAST ROOM

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6 Sheets-Sheet 2

Fig. 2.



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AIR-SOLIDS SEPARATION SYSTEM FOR BLAST ROOM

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6 Sheets-Sheet 3

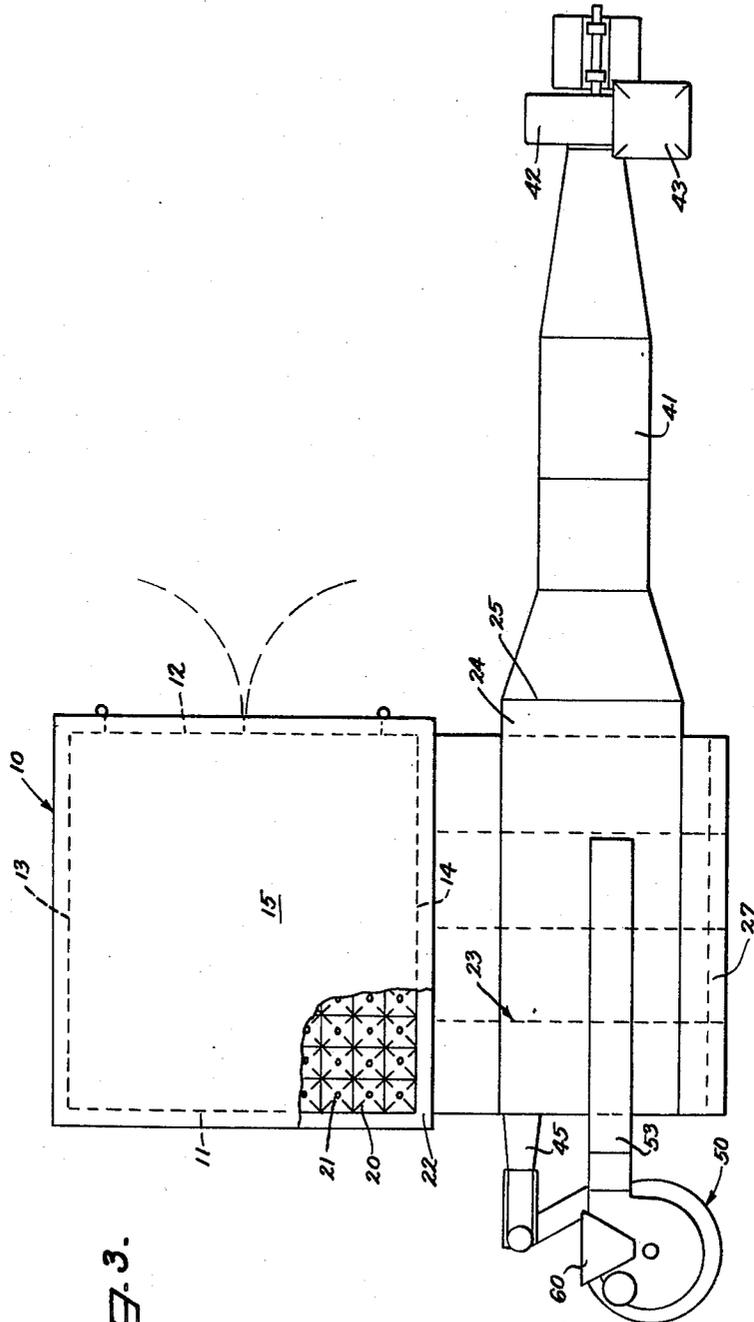


FIG. 3.

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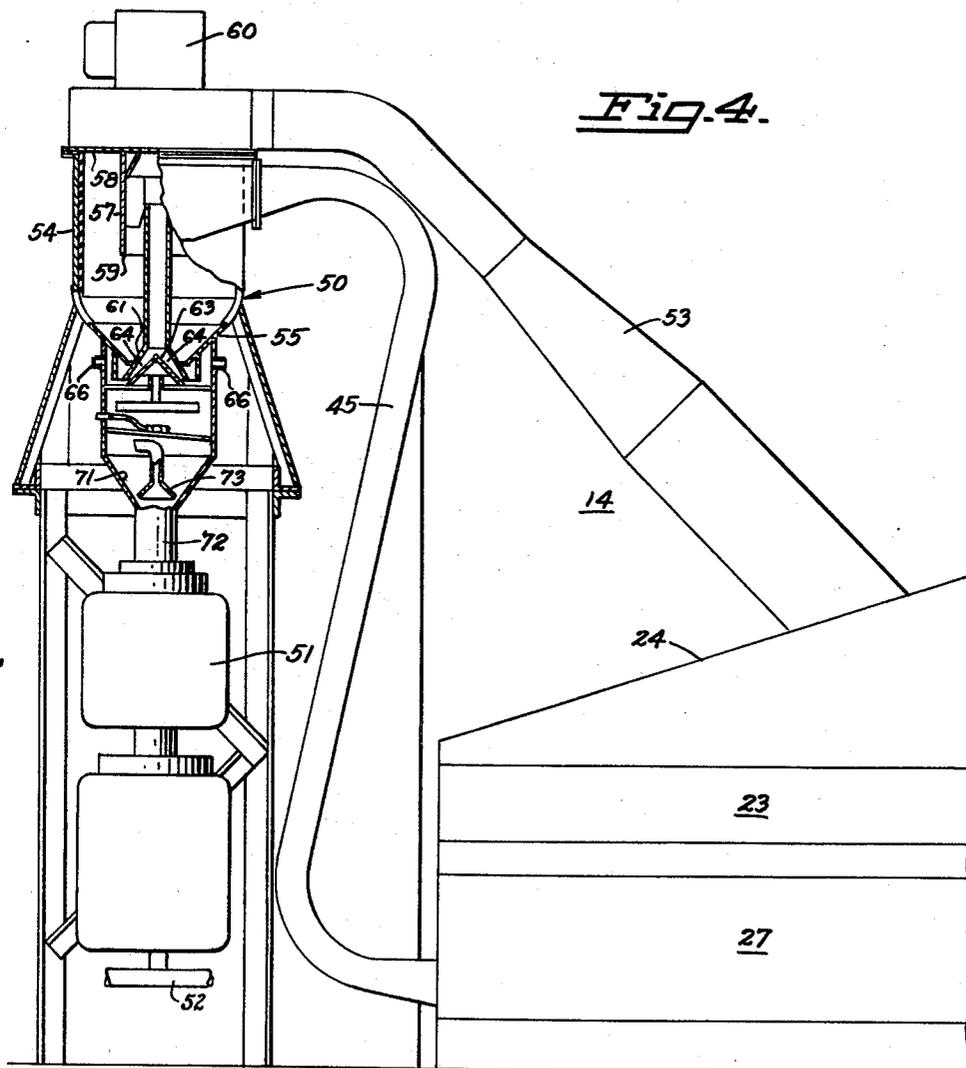
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AIR-SOLIDS SEPARATION SYSTEM FOR BLAST ROOM

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6 Sheets-Sheet 4



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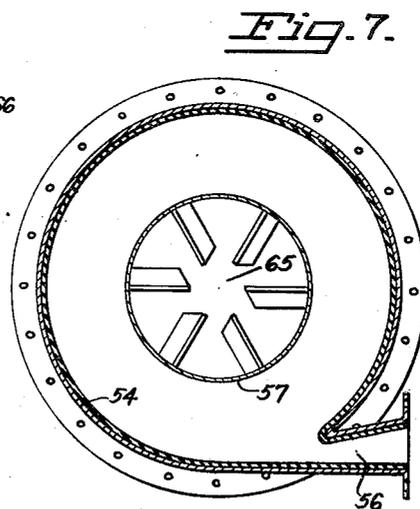
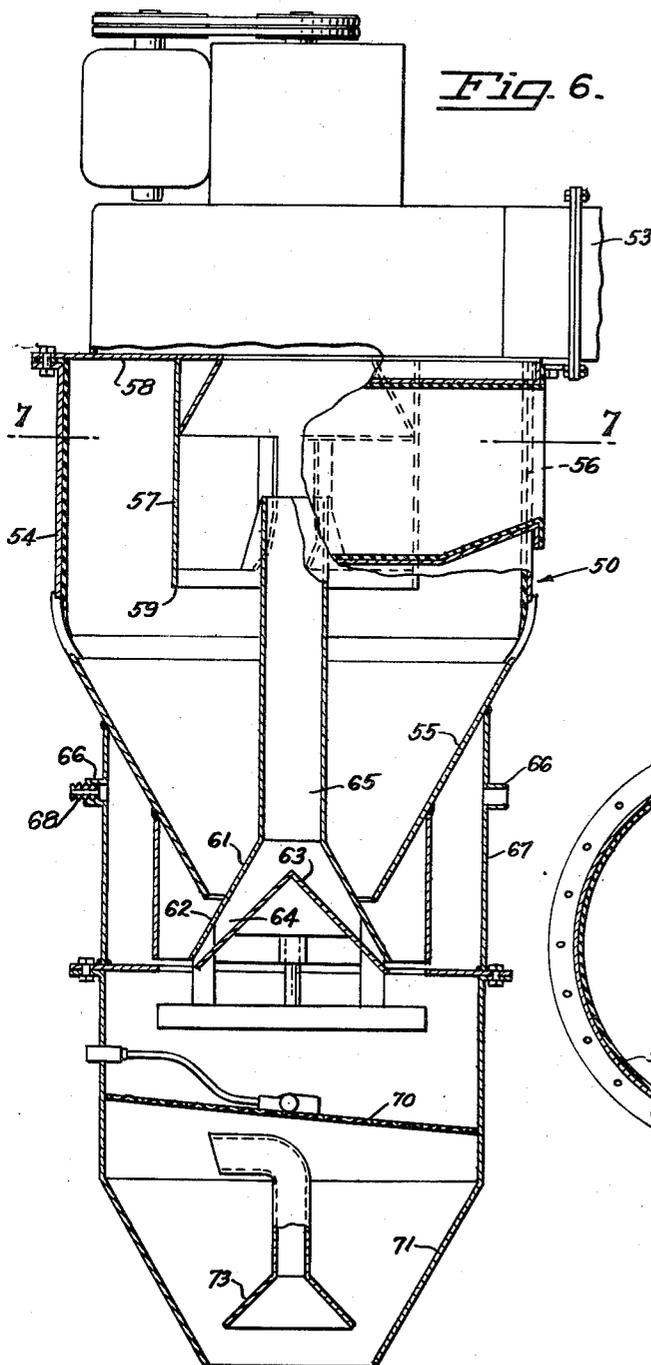
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AIR-SOLIDS SEPARATION SYSTEM FOR BLAST ROOM

Filed Oct. 22, 1957

6 Sheets-Sheet 6



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2,935,820

AIR-SOLIDS SEPARATION SYSTEM FOR BLAST ROOM

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Application October 22, 1957, Serial No. 691,687

16 Claims. (Cl. 51—8)

This invention relates to an improved blast room; i.e., a room in which articles are subjected to a blast of abrasive. More particularly, the invention relates to a blast room provided with an air and abrasive circulation system, wherein the spent abrasive from the blast hose is removed from the room by a conveying air stream, separated from the air stream, and redirected to the blast hose. Still more particularly, the invention relates to apparatus for separating the spent abrasive from the conveying air stream, for cleaning the abrasive from dust and waste, and for returning the purified and reclaimed abrasive to the blast hose.

A pending application by Ted Adamson Arnold, Serial No. 456,257, filed September 15, 1954, and issued June 17, 1958, as Patent No. 2,839,338 has set forth a blast room utilizing a "waffle floor," a floor with a large number of small shallow hoppers that empty into shallow ducts. This room is a great improvement over blast rooms with a single large deep hopper requiring excavation. The abrasive which falls through the waffle floor empties from the hoppers into the ducts and is carried out therefrom by air, along with the waste and dust abraded from the objects being blasted. Another co-pending application, by William H. Mead, Serial No. 667,766, filed on or about June 25, 1957, discloses a room with an improved form of the waffle floor and an air intake system that obtains uniform down-draft ventilation, giving greatly improved visibility to the blaster. This ventilation system also comprises improvements in the carrying away of abrasive and waste particles. The present invention relates to the separation of such abrasive from the air stream and its reclamation.

Several problems have arisen from the use of an air stream both to ventilate the room and also to convey abrasive away. For one thing, the provision of an adequate ventilation system requires a large excess of air over that needed for abrasive conveyance. One important object of the present invention is to provide preliminary separation of the great bulk of this air from a smaller abrasive-laden portion. The accomplishment of this object makes it possible to channel the bulk of clean air directly through a dust filter to the air exhaust mechanism, while only a relatively small proportion of the air is used to carry all the abrasive to the reclaimers. An important advantage of this early separation is a considerable saving in the construction and operation of the reclaimer system, since it can be much smaller because of the smaller volume of air it has to handle. Shipping weight, space, and materials can be saved in very significant amounts.

The invention separates the bulk of the air from the abrasive by means of a plenum chamber with an inlet at its lower end and a novel baffle-type skimmer assembly. The baffles both deflect the abrasive particles, break their velocity, and hold them down below the skimmer in a duct of small cross-sectional area, from which they are carried by about 10% to 20% of the air into a reclaimer.

Another object of the invention is to provide means for taking off the largest fractions of abrasive-free air near where the abrasive-conveying air stream enters the

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plenum chamber. There, the air is relatively clean and easily skimmed. A smaller proportion of the air is taken from the farther end, where it tends to be more contaminated and less easily skimmed.

Another object of the invention is to provide an improved reclaimer structure for recovering the abrasive from a mixture of abrasive and air.

Another object of the invention is to provide a novel blast-room abrasive-reclamation system.

Other objects and advantages of the invention will appear from the following description of a preferred embodiment thereof.

In the drawings:

Fig. 1 is a view in perspective, with portions broken away, of a blast room and the external air-exhaust, filtering, and reclamation portions of a system embodying the principles of the invention.

Fig. 2 is a view in side elevation of the outside of the blast room of Fig. 1, showing the exhaust, filtering, and reclamation system. The reclaimer is shown in this view and in Figs. 3 and 4 in a slightly different relative position for the sake of clarity, but this positioning is not significant.

Fig. 3 is a top plan view of the room and associated equipment, portions thereof being broken away to show some portions that normally are covered.

Fig. 4 is a view in elevation and partly in section of the abrasive reclaimer and adjacent portions of the apparatus.

Fig. 5 is a view on an enlarged scale in elevation and in section of the skimmer showing the baffle structure.

Fig. 6 is an enlarged view in elevation and in section of the reclaimer of Fig. 4.

Fig. 7 is a view in horizontal section taken along the line 7—7 in Fig. 6.

The blast room 10 shown in Figs. 1 to 3 may comprise a chamber enclosed by end walls 11 and 12 and side walls 13 and 14. The room 10 may have a roof 15 or it may be located inside a large building where it is unnecessary for it to have its own roof. The room 10 preferably has an air inlet maze constituting a false ceiling; this maze may comprise a wire screen 16 or a baffle arrangement (see application Serial No. 667,766, filed June 25, 1957). The room 10 also has a perforate floor 17, comprising heavy wire mesh screen, expanded metal, perforated steel plate, or other strong, perforate, supporting surface for the blaster 18 and the objects 19 to be blasted. The screen 17 rests on a waffle floor 20 through which the spent abrasive and waste falls and through which the down draft of air leaves. The waffle floor 20 includes a series of small shallow hoppers 21 leading into a series of ducts 22 through which the stream of air carries the spent abrasive and waste into the lower end of a concentrator 23.

The concentrator 23 (see Fig. 5) includes a large, unitary chamber, preferably extending along beside the lower part of the wall 14 for substantially the full length of the room 10. Its top wall 24 slopes upwardly toward an exhaust end 25 to accommodate the increase in volume of the air moving therethrough as duct after duct adds its air to that brought by the ducts 22 nearer the lower end. The ducts 22 pass under the wall 14; the air and abrasive mixture then passes through a wide, upwardly sloping duct 26 which leads through the concentrator 23 and out the other side into a vertical duct 27 with a 180° bend which reverses the direction of flow and sends the air into a skimmer 30. The purpose of the vertical duct 27 is to gain altitude, so that the skimmer will be high enough to give space for a conduit 45 without having to excavate for it. The 180° bend is one means of keeping the ducting close to, in fact immediately adjacent to, the blast room wall 14 while gaining the needed altitude.

The skimmer 30 is much larger in cross-sectional area than the ducts 26 and 27 and it preferably becomes progressively wider with increased distance from its inlet 31. It incorporates a series of generally vertical baffles 32 running the length of the concentrator 23 and spaced across the major portion of its width. Above the skimmer 30 is a plenum chamber 35 of much larger volume than the total cross-sectional area of the ducts 22, 26, and 27 and occupying by far the preponderance of space in the concentrator 23. In this large space 35, the air velocity slows down, thereby aiding the settling out of stray abrasive particles which fall back down through the skimmer 30, even if they manage to pass through the baffles 32, which deflect almost all these particles into the reclaiming air stream.

Each baffle 32 preferably comprises a vertical upper portion 36 and a sloping lower portion 37. The lower portion 37 preferably lies at an angle of about 115° with respect to the vertical portion 36. In a typical unit, the baffles are uniformly spaced at 1/4 inch intervals, and the end of the lower portion 37 of one baffle preferably lies at or near the plane of the vertical portion 36 of the succeeding baffle 32.

In the concentrator 23, the skimmer 30 separates out most (about 80%) of the air from the abrasive, and this abrasive-free air is conducted through the plenum chamber 35 to a dust filter 41, which removes any small and light waste particles that manage to escape the skimmer 30. From the filter 41 the air goes through a blower 42 to an exhaust opening 43. The air, of course, may be rechanneled into the room 10 instead of being blown out through the opening 43, if that is desired.

The smaller portion (about 20%) of the air carrying all the abrasive, passes down through a hopper 44 into a conduit 45. The end wall 46 of the concentrator is provided with baffles 47 (like the baffles 32 but turned about 155° counterclockwise) which deflect the abrasive and waste downwardly and into the hopper 44, preventing wear on the end wall 46. The conduit 45 lies above the duct 26, by virtue of the gain in altitude and the reversal in direction provided by the duct 27. Thus there is no need to excavate for the concentrator-reclaimer section. From the conduit 45 the stream passes to reclaimer unit 50 where the abrasive is separated from the remaining air, the abrasive falling into a reservoir 51 from which, by suitable valves, it is introduced into the blast hose 52 for re-use by the blaster 18. The air that is separated out in the reclaimer is, meanwhile, returned into the plenum chamber 35 through a duct 53 and exhausted with the previously skimmed air.

Thus the concentrator 23 separates the major portion of the air from the abrasive and from a minor portion of the air that conveys the abrasive. This is a very important feature of this invention. For one thing, it means that less than 20% of the air has to be passed through the reclaimer 50 and be processed there. It means that the other 80% to 90% of the air can be channeled directly to the blower 42 through the dust filter 41. This, in turn, means that a great amount of ducting is saved in making the conduits 45; for small conduits 45 can convey the abrasive-laden air stream to the reclaimer 50. Moreover, the reclaimer 50 itself can be much smaller than it could be if all the air had to pass through it. Still further, a much smaller horsepower in the blower 42 can accomplish the same result that would require a larger power loss without the separation. For example, in a unit where the entire air stream was conducted through the reclaimer 50, a vacuum of about 17 inches of water was required in the blower 42. In a unit of exactly the same capacity differing only in employing the present invention, so that only a small proportion of the air went through the reclaimer 50 and most of the air went directly to the blower 42, the vacuum was reduced to 12 inches. This significant reduction means that a

much lower horsepower will be required to operate the blower.

The skimming operation also means that much less steel is required in the formation of the conduits 45, reclaimer 50, and other parts. Only a fraction of the very large steel installation required in prior art structures is required in the present invention. Thus, to review the operation thus far, the air carrying the abrasive and dust is separated from its abrasive content by the deflecting action of the baffles 32 and by the settling action of the abrasive in the large plenum chamber 35, and the purified air is conducted directly to the blower 42, while the abrasive is carried to the reclaimer 50 in a much smaller stream of air.

The reclaimer 50 of this invention, while resembling the reclaimers shown in patents Nos. 2,635,745 and 2,667,909 and co-pending application Serial No. 489,127, filed February 18, 1955, and issued as Patent No. 2,833,407, also has important novel features enabling its use in connection with very large amounts of air required in a blast room as compared with the relatively small amounts of air used in individual blasting machines. The upper portion of the reclaimer 50 comprises a cylindrical housing 54 with a conical lower end 55, providing a cyclone chamber into which a tangential inlet 56 is provided, through which pass the air and the abrasive from the conduit 45. Concentric with the outer cylindrical wall 54 is an inner cylindrical wall 57 extending down from the top wall 58 of the reclaimer 50 below the inlet 56. This wall 57 provides a very sharp turn 59 for the air up into the outlet duct 52 by which it is returned to the plenum chamber 35.

While it is possible to use the main blower unit 42 to obtain the air pressure needed to carry the air-borne abrasive into the cyclone and to extract the air through the outlet duct 52, nevertheless economies can be made or the device can be made more practically by providing a small separate blower unit 60 on top of the reclaimer 50. This helps, because the sharp turn the air takes at the wall 57 would otherwise place an undue load on the blower 42. The cost of operating this smaller blower 60 is only a fraction of that of the larger blower 42, and the net result is a substantial saving in the power used. As the air turns the sharp corner 59 into the duct 52, abrasive is expelled centrifugally against the outer wall 54 and falls down the slope 55.

Practically 100% of the abrasive is removed in the cyclone. However, along with the removal of reusable abrasive, solid particles of waste material are also removed. These waste particles have a substantially lower terminal velocity than the reusable abrasive particles (they will be conveyed in an air stream moving too slowly to convey the reusable abrasive), and this invention provides means for winnowing them from the reusable abrasive. The conical floor 55 converges radially inwardly toward an inverted cone 61 where the material falls on a slide 62 and is directed downwardly and radially outwardly. Spaced inwardly and concentrically from the upper cone 61 is an inner cone 63 which is inclined at an angle less steep than that of the cone 61, so that the two cones 61 and 63 diverge from each other as one moves toward their upper ends. The space 64 between the inner and outer cones 61 and 63 is used to carry the waste and air up into a short outlet duct portion 65 which leads up into the main outlet duct 53.

A series of inlets 66 are provided in an outer housing wall 67 opposite the lower end of the area between cones 61 and 63. The inlets 66 may be comprised of a series of circular openings, such as can be provided by standard one-inch pipe couplings. Pipe bushings 68 may be inserted to vary the amount of air admitted by the inlets 66. With the adjustment made, air from the outside enters through the gates 66 spaced around the housing 67 and passes through the falling mixture of abrasive and waste. As this mixture falls from the lower end of

the cone 61, it is therefore winnowed by the entering stream, the velocity of which is adjusted by adjusting the inlets 66 and the height of adjustable cone 63. Should any abrasive be carried up into the space 64 between the two cones 61 and 63, the diverging nature of the cones results in a drop in velocity in the larger cross-sectional area, as stated in Serial No. 489,127 filed February 18, 1955; so the abrasive settles back and falls down the inner cone 63 and slides off its lower end.

The abrasive, having been purified by separation of the dust therefrom, next falls through a vibrated screen 70 and down through a hopper 71 into a retainer 72 which may be substantially like that shown in application Serial No. 489,127 filed February 18, 1955 (Patent No. 2,833,407). At the screen 70 large waste particles such as welding slag are removed. Similarly, an anti-puff device 73 of the same general type as that shown in the same application, is used for the same purpose. From there, by suitable valving described in the aforesaid patent application, the abrasive falls into the reservoir 51 and is returned to the blast hose 52, where it is available to the operator 18, the feeding means here being well-known in the art. (For example, see Patent No. 2,521,931).

Summarizing the operation of this reclaimer 50, it will be seen that the air enters through the cyclone carrying the abrasive and waste with it. The waste and grit impinge upon the outer wall 54 and fall to the slides 55 and 61, while the air turns a 180° angle and goes up to the outlet duct 52. Other air entering through the inlets 66 passes through stream of abrasive falling off the slide 62 and goes into the space 64 between the cones 61 and 63, carrying with it the light particles of waste into the duct 52, while the abrasive falls into the hopper 51 for re-use.

To those skilled in the art to which this invention relates, many changes in construction and widely differing embodiments and applications of the invention will suggest themselves without departing from the spirit and scope of the invention. The disclosures and the description herein are purely illustrative and are not intended to be in any sense limiting.

I claim:

1. In an abrasive blast room having blast means by which abrasive is impelled against objects to be treated, a perforate waffle-type floor with shallow abrasive-collecting hoppers emptying into conveying ducts, and means providing a down-draft of ventilating air that is used to convey away the expended abrasive and blast waste through said conveying ducts, the combination therewith of: a concentrator into which said ducts lead, said concentrator having means for separating the great preponderance of air from a smaller portion containing substantially all of the reusable abrasive and most of said waste; means for filtering said preponderance of air and exhausting it to the atmosphere; abrasive reclaiming means for separating said smaller air portion from said abrasive and waste; means for winnowing said waste from said abrasive; and means for filtering the air separated from said abrasive and the waste-laden winnowing air; and means for feeding the reclaimed winnowed abrasive to said blast means.

2. In an abrasive blast room having blast means by which abrasive is impelled against objects to be treated, a perforate waffle-type floor with shallow abrasive-collecting hoppers emptying into conveying ducts, and means providing a down-draft of ventilating air that is used to convey away the expended abrasive and blast waste through said conveying ducts, the combination therewith of: concentrator means for separating the great preponderance of air from a smaller portion containing substantially all of the reusable abrasive and most of said waste; and abrasive reclaiming means for separating said abrasive from said smaller air portion.

3. In an abrasive blast room having blast means by which abrasive is impelled against objects to be treated, and means providing a down-draft of ventilating air to

convey away the expended abrasive and blast waste through conveying ducts, the combination therewith of: a concentrator into which said ducts lead, said concentrator having means for separating the great preponderance of air from a smaller portion containing substantially all of the reusable abrasive and most of said waste; abrasive reclaiming means for separating said smaller air portion from said abrasive and waste; means for winnowing said waste from said abrasive; and means for filtering all the air separated from said abrasive.

4. In an abrasive blast room having a blast hose through which air-entrained abrasive is impelled against objects to be treated, having a perforate waffle-type floor with shallow abrasive-collecting hoppers emptying into conveying ducts, and having means providing a down-draft of ventilating air that is also used to convey away the expended abrasive through said conveying ducts, the combination therewith of: a concentrator into which said ducts lead, said concentrator having a housing and a skimmer with a series of baffles dividing said housing into a large plenum chamber and a smaller skimmer chamber, said skimmer separating the great preponderance of air from a smaller portion containing substantially all of the reusable abrasive and also waste, and passing said preponderance of air into said plenum chamber, said skimmer having an outlet duct through which said smaller portion carries the reusable abrasive and waste; dust filter means through which said preponderance of air passes from said plenum chamber; first blower means pulling said preponderance of air from said plenum chamber and dust filter means and exhausting it through an exhaust opening; an abrasive reclaimer connected to said outlet duct, where the remainder of the air is separated from said abrasive and waste; means for taking in atmospheric air into said reclaimer for winnowing said waste from said abrasive; conduit means for conducting said remainder of air and the waste-laden winnowing air from said reclaimer to said duct filter; and means for feeding the reclaimed winnowed abrasive to said blast hose.

5. Air-cleaning and abrasive-reclaiming apparatus for use with an abrasive blast room from which the spent abrasive and waste is conveyed in an air stream containing air greatly in excess of that needed for conveyance, comprising: a concentrator into which said air stream conveys said abrasive and waste, said concentrator having a housing; a skimmer having a series of downwardly extending baffles dividing said housing into a large plenum chamber above said baffles and a smaller chamber therebelow; means to direct said air stream into said smaller chamber so that the great preponderance of air passes into said plenum chamber through said baffles, said baffles and the expansion of said air in said plenum chamber freeing it of substantially all of the reusable abrasive, said skimmer chamber emptying into an outlet duct through which a much smaller portion of said air carries the reusable abrasive and waste; an abrasive reclaimer connected to said outlet duct, where said smaller portion of air is separated from said abrasive and waste; means for taking in atmospheric air into said reclaimer for winnowing said waste from said abrasive; conduit means for conducting said remainder of air and the waste-laden winnowing air away from said reclaimer; dust filter means to which all said air is fed; and main blower means for pulling said air.

6. The apparatus of claim 5 wherein said baffles each have a vertical leg and an inclined leg below said vertical leg extending in the direction of flow of the air stream, and wherein each said inclined leg terminates substantially in the plane of the succeeding vertical leg.

7. In an abrasive blast room having a blast hose through which air-entrained abrasive is impelled against objects to be treated, having a perforate waffle-type floor with shallow abrasive-collecting hoppers emptying into ducts below said floor, and having means providing

a down-draft of ventilating air that is also used to convey away the expended abrasive through said ducts, the combination therewith of: a conduit into which said ducts empty and leading out from said room in a lower portion and upwardly and turning 180° and heading toward said room at a higher portion; a concentrator into which said higher portion leads, said concentrator having a housing and a skimmer with a series of baffles dividing said housing into a large plenum chamber and a smaller skimmer chamber, said skimmer separating the great preponderance of air from a smaller portion containing substantially all of the reusable abrasive and also waste, and passing said preponderance of air into said plenum chamber, said skimmer having an outlet opening through which said smaller portion carries the reusable abrasive and waste; an outlet duct below said upper portion of said conduit and above said upper portion into which said outlet opening leads; dust filter means through which said preponderance of air passes from said plenum chamber; first blower means pulling said preponderance of air from said plenum chamber and dust filter means and exhausting it through an exhaust opening; an abrasive reclaimer connected to said outlet duct and having a cyclone where the remainder of the air is separated from said abrasive and waste, and a sloping conical slide for said abrasive and waste leading out from said cyclone; second blower means for causing suitable division of air flow through said reclaimer and outlet duct; means for taking in atmospheric air into said reclaimer for winnowing said waste from said abrasive; conduit means for conducting both said remainder of air from said cyclone and the waste-laden winnowing air from said reclaimer to said dust filter; and means for feeding the reclaimed winnowed abrasive to said blast hose.

8. A concentrator for separating abrasive and waste from a conveying air stream, said concentrator having a housing; a skimmer having a series of downwardly extending baffles dividing said housing into a large plenum chamber above said baffles and a smaller chamber therebelow; means to direct said air stream into said smaller chamber so that the great preponderance of air passes into said plenum chamber through said baffles, said baffles and the expansion of said air in said plenum chamber freeing it of substantially all of the reusable abrasive, said skimmer chamber emptying into an outlet duct through which a much smaller portion of said air carries the reusable abrasive and waste; dust filter means; and blower means pulling said preponderance of air from said plenum chamber and dust filter means and exhausting it through an exhaust opening.

9. In an abrasive reclaiming system for air-entrained abrasive mixed with waste, a concentrator having a housing and a skimmer with a series of baffles dividing said housing into a large plenum chamber and a smaller skimmer chamber into which the air and abrasive are conducted, said skimmer separating the great preponderance of air from a smaller portion containing substantially all of the reusable abrasive and also waste, and passing said preponderance of air into said plenum chamber, said skimmer having an outlet duct through which said smaller portion carries the reusable abrasive and waste, said plenum chamber also having air exhaust means; an abrasive reclaimer connected to said outlet duct, where said smaller portion of air is separated from said abrasive and waste; and means for winnowing said waste from said abrasive.

10. In an abrasive reclaiming system for air-entrained abrasive mixed with waste, a concentrator having a housing and a skimmer with a series of baffles dividing said housing into a large plenum chamber and a smaller skimmer chamber into which the air and abrasive are conducted, said skimmer separating the great preponderance of air from a smaller portion containing substantially all of the reusable abrasive and also waste, and passing

said preponderance of air into said plenum chamber, said skimmer having an outlet duct through which said smaller portion carries the reusable abrasive and waste, said plenum chamber also having air exhaust means.

11. In an abrasive-blast room, the combination of: means in said room for impelling abrasive against a workpiece in said room; conveying means in said room for entraining the spent abrasive and resultant waste in an airstream and carrying them away from said room in said airstream; means connected to said conveying means for concentrating the reusable abrasive and much of the waste into one small part of the airstream; and means connected to the concentrating means for separating the abrasive from said small part, said impelling means being connected to said separating means for re-impelling the resultant reclaimed abrasive into said room.

12. In an abrasive-blast room, the combination of: means for impelling abrasive against a workpiece in said room; means for ventilating said room with a strong down-draft of air; means for entraining the spent abrasive and resultant waste in said down-draft; means for carrying the resultant airstream with the entrained abrasive and waste away from said room; means for concentrating the reusable abrasive and much of the waste into one small part of the airstream and having exhaust means for the remainder of said airstream; means connected to said exhaust means for filtering and exhausting to the atmosphere the remainder of the airstream; means connected to said concentrating means for separating the abrasive and waste from said small part; means connected to said separating means for winnowing said waste from said abrasive; and means connected to said separating means and said winnowing means for filtering and exhausting to the atmosphere said small part of said airstream after separation, and the winnowing air after winnowing; said means for impelling being connected to said winnowing means for re-impelling the resultant reclaimed abrasive into said room.

13. In an abrasive-blast room, the combination of: means in said room for impelling abrasive against a workpiece in said room; means for ventilating said room with a large excess of air over that needed for conveying the spent abrasive; conducting means in said room for carrying the spent abrasive and resultant waste away from said room entrained in the resultant airstream; means connected to said conducting means for skimming the reusable abrasive, much of the waste, and one small part of the airstream from a preponderant part thereof; means connected to said skimming means for filtering and exhausting to the atmosphere said preponderant part; means connected to said skimming means for reclaiming the abrasive from said small part; and means connected to said reclaiming means for filtering and exhausting to the atmosphere said small part.

14. Apparatus for cycling abrasive in connection with a blast room, comprising: means for impelling abrasive into said room; means for ventilating said room by sending therein a down-draft of air; means for entraining the spent abrasive and resultant waste in said air; means for carrying said air, abrasive, and waste away from said room; means for skimming the abrasive and much of the waste from a major part of said air and conveying it away in a minor part of said air; means for separating the abrasive from said small part and from said waste, said means for impelling being connected to said separating means; and means for filtering the waste from all the air and exhausting it to the atmosphere.

15. An abrasive blast room, comprising: means for blasting in said room with abrasive-entrained air; means for ventilating said room with a down-draft of air much greater in quantity than that used to entrain the abrasive; means for carrying the spent abrasive and resultant waste away from said room in the total resultant airstream; means for concentrating the abrasive and much

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of the waste into a small fraction of the total airstream; means for filtering and exhausting to the atmosphere the preponderance of the air, which is substantially abrasive-free; means for separating the abrasive and waste from said small fraction; means for winnowing said waste from said abrasive, by taking in additional air; means for filtering and exhausting to the atmosphere the air from said small fraction and the winnowing air; and means for redirecting the reclaimed abrasive into said room in an airstream.

16. An abrasive blast room, comprising means for blasting in said room with abrasive-entrained air; means for ventilating said room with a down-draft of air much greater in quantity than that used to entrain the abrasive; means for carrying the spent abrasive and resultant waste away from said room in the total resultant airstream; means for skimming off substantially all the reusable abrasive, much of the waste, and a small fraction

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of the air from the preponderance of the air, so that said preponderance is substantially abrasive free; means for filtering and exhausting the preponderance of the air; means for separating the abrasive and waste from said small fraction; means for winnowing said waste from said abrasive to reclaim the abrasive and entrain said waste in said small fraction while taking in a small amount of additional winnowing air; means for filtering and exhausting said small fraction and the winnowing air; and means for redirecting the reclaimed abrasive into said blasting means.

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UNITED STATES PATENT OFFICE
CERTIFICATE OF CORRECTION

Patent No. 2,935,820

May 10, 1960

William H. Mead

It is hereby certified that error appears in the printed specification of the above numbered patent requiring correction and that the said Letters Patent should read as corrected below.

Column 1, line 56, for "smal" read -- small --; column 6, line 38, for "duct" read -- dust --; column 8, line 61, for "mens" read -- means --.

Signed and sealed this 1st day of November 1960.

(SEAL)

Attest:

KARL H. AXLINE

Attesting Officer

ROBERT C. WATSON
Commissioner of Patents