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(54) **INFEED DEVICE FOR DEDUSTING APPARATUS**

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(57) **ABSTRACT**

An infeed device provides a configuration that improves the flow of particulate material into a double wash deck dedusting apparatus. The infeed device is formed with a circular inlet opening, an oval-shaped discharge opening and step sides interconnecting the inlet and discharge openings to prevent bridging in particulate material being fed through the infeed device onto the wash decks. The infeed device can be formed as a separate member that can be inserted into the infeed opening of existing dedusters. The oval-shaped discharge opening is substantially smaller transversely than the diameter of the inlet opening, but has a longitudinal length that is equal to the diameter of the inlet opening and equal to the longitudinal length of the wash decks. The joinder of the wash decks is blunted to eliminate a divider edge on which plastic streamers can hang up while being fed to the wash decks.

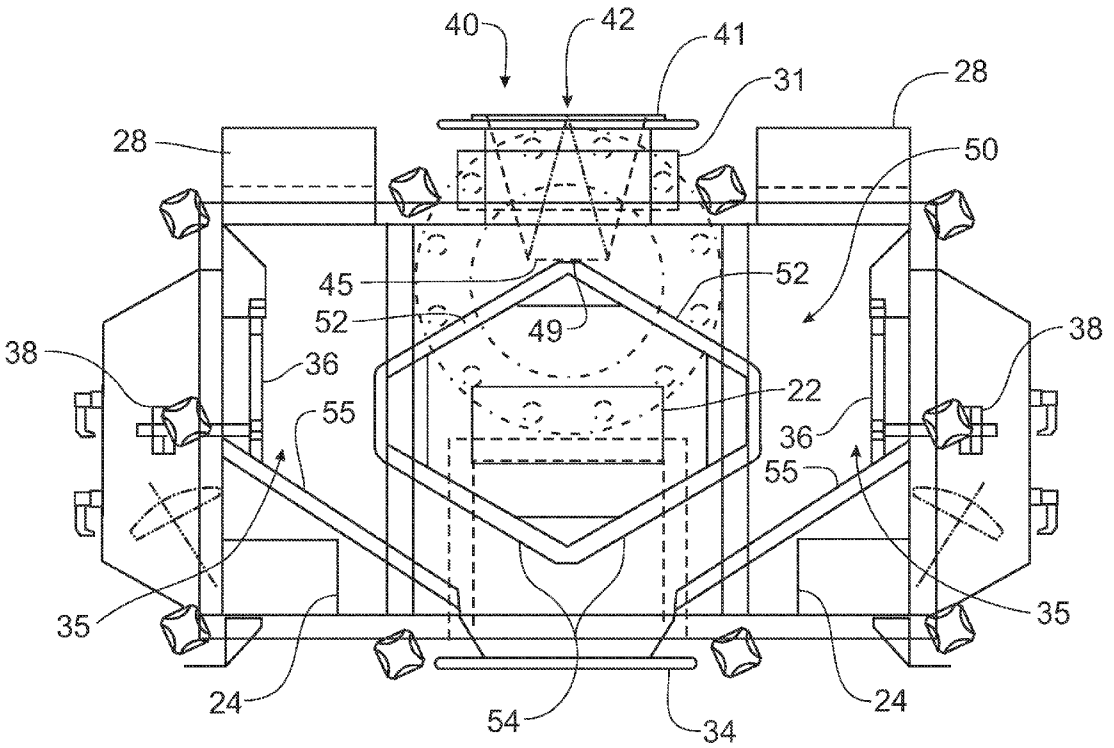
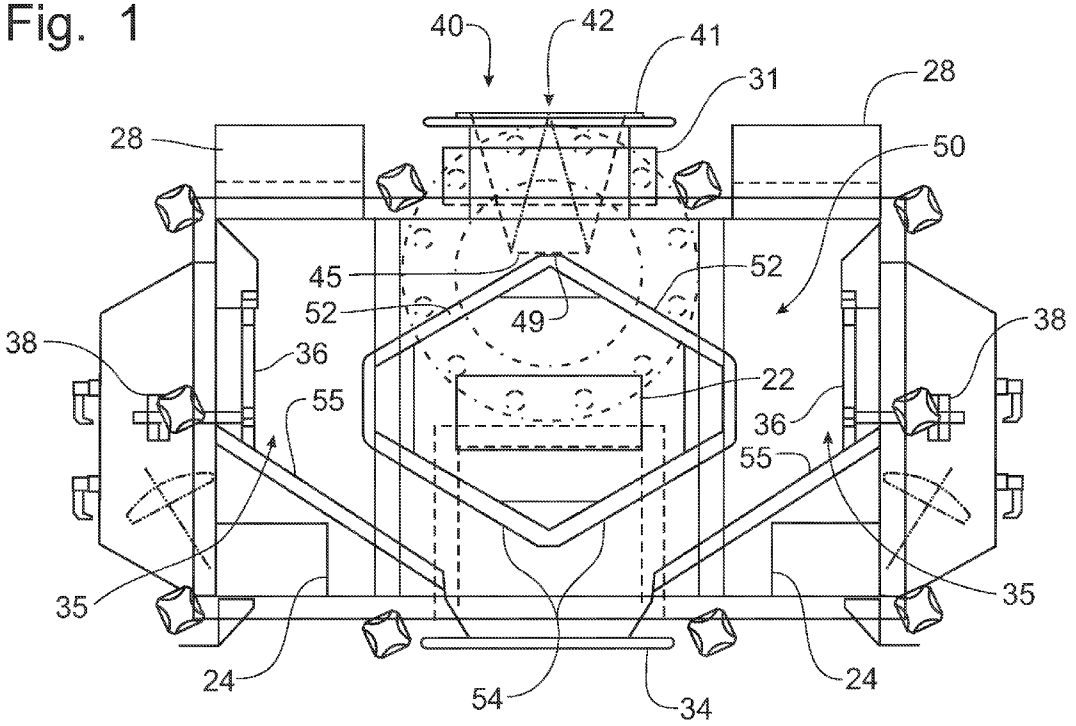


Fig. 1



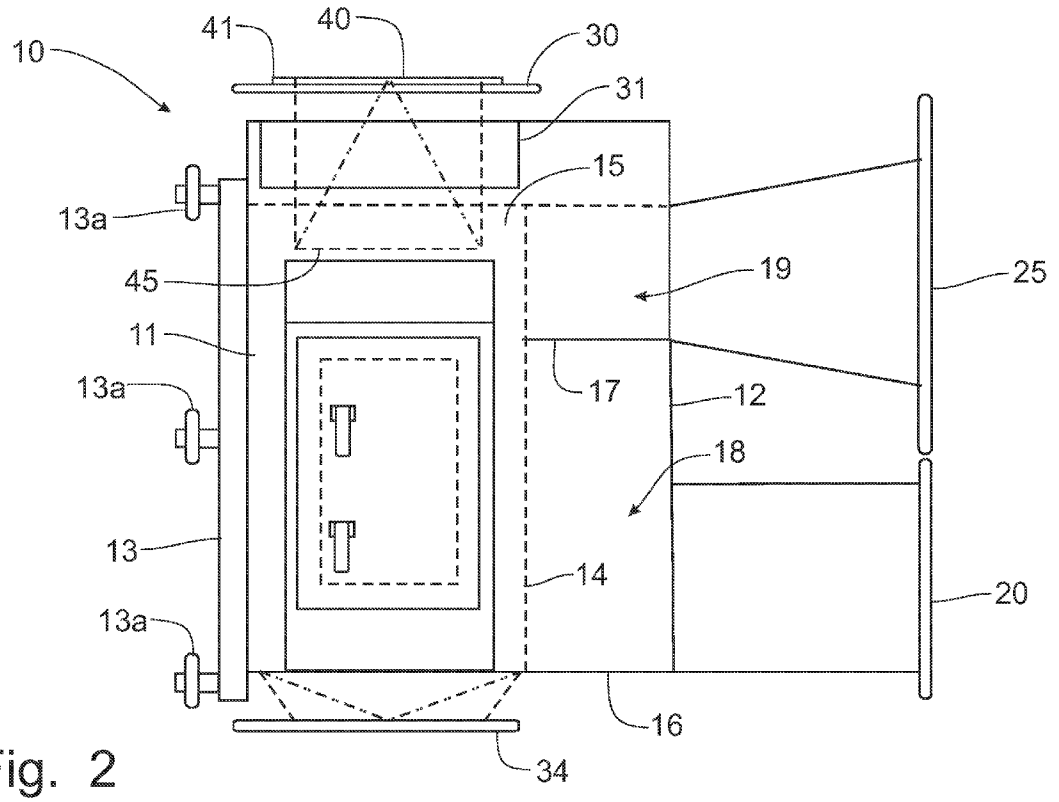


Fig. 2

Fig. 3

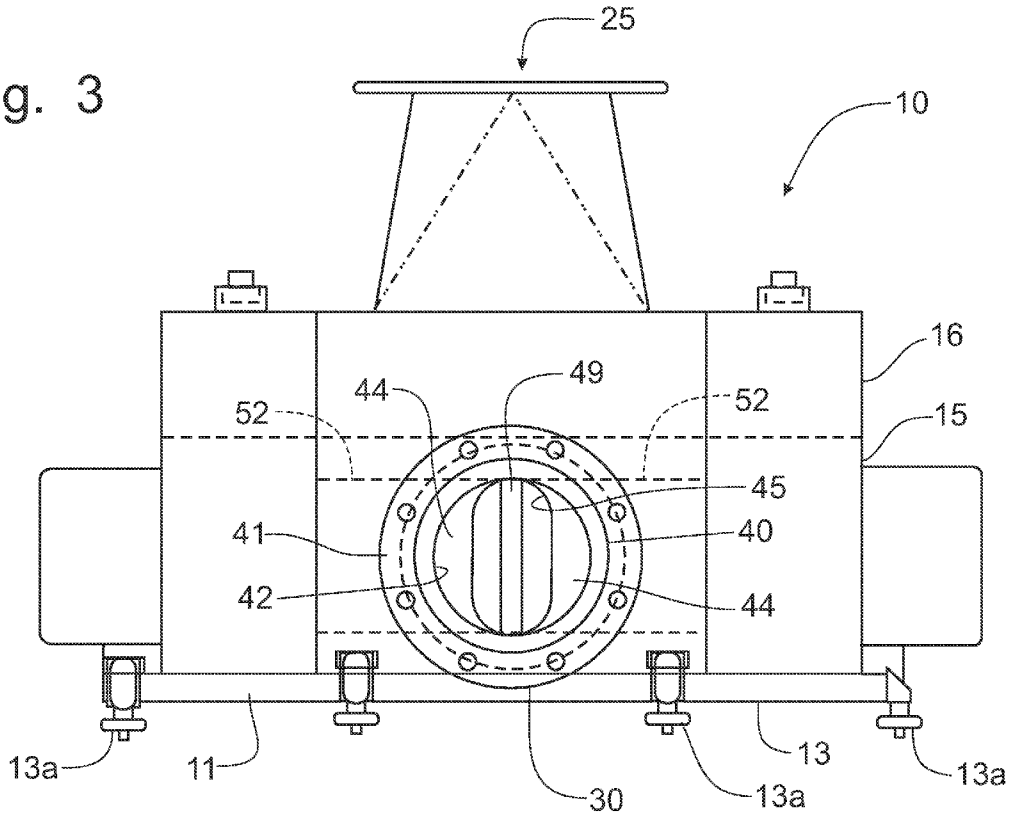
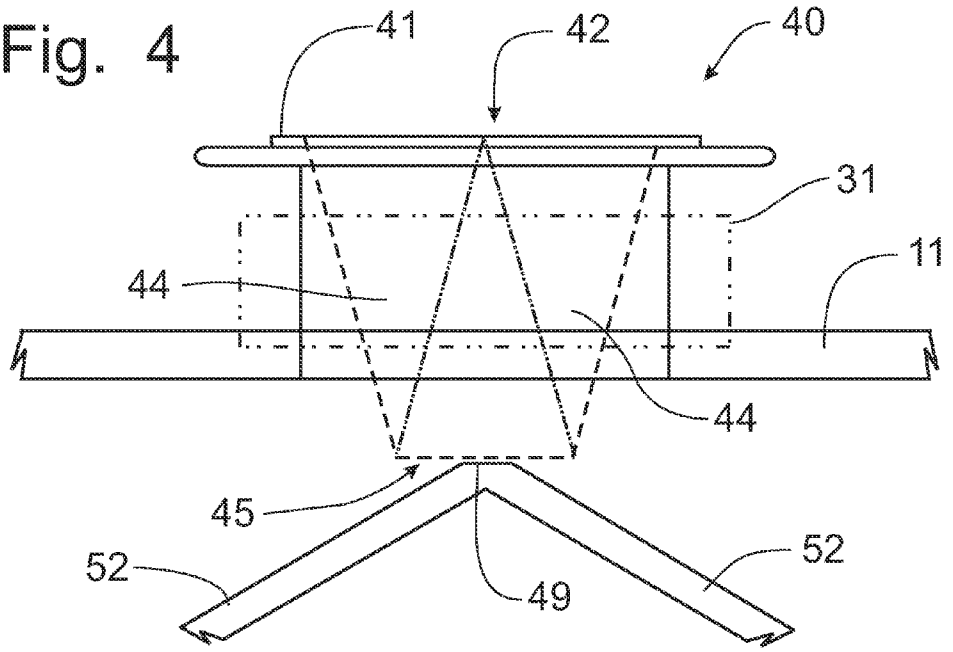


Fig. 4



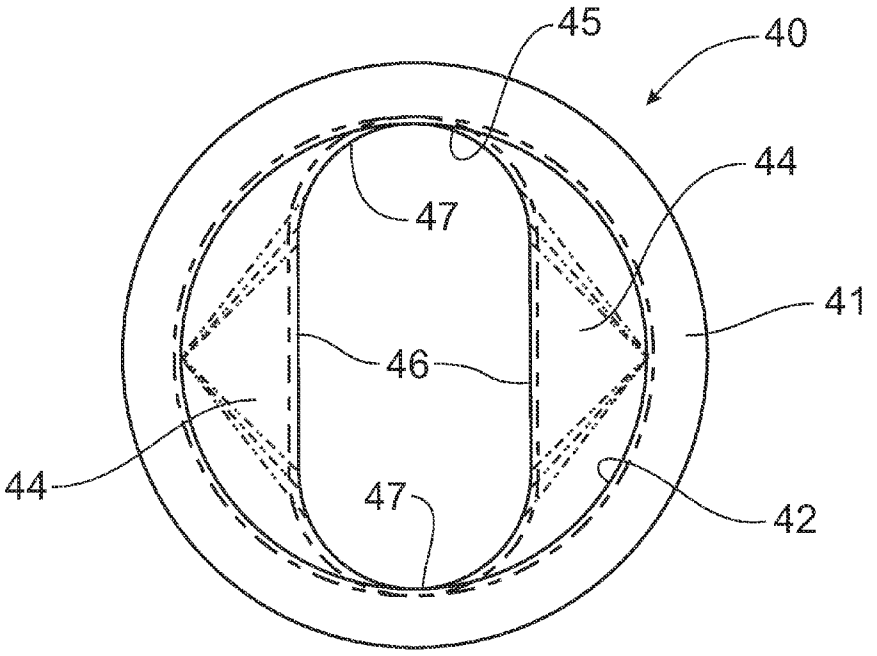
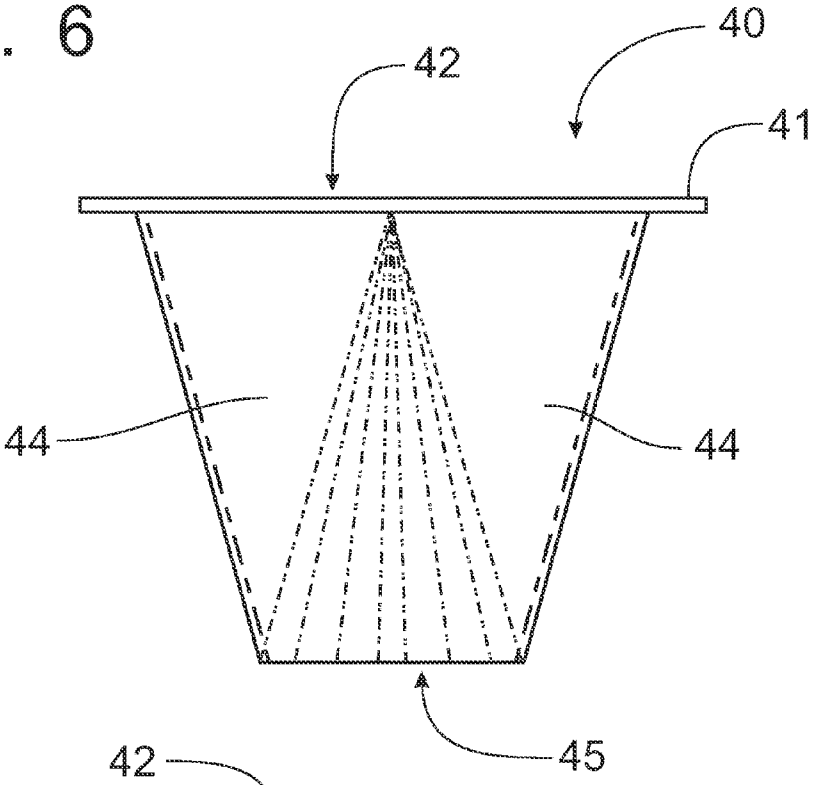


Fig. 5

Fig. 6



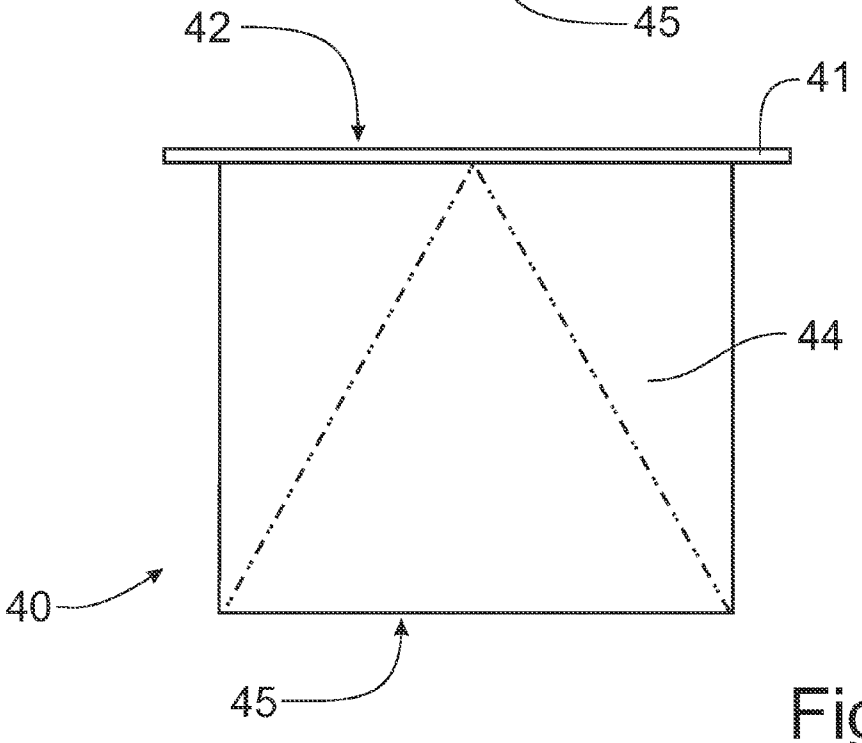


Fig. 7

INFEED DEVICE FOR DEDUSTING APPARATUS

FIELD OF THE INVENTION

[0001] The present invention relates generally to an apparatus for the cleaning and handling of particulate materials, such as plastic pellets, grains, glass, and the like, and, particularly, to an infeed device for directing the particulate material onto the wash decks of the dedusting apparatus.

BACKGROUND OF THE INVENTION

[0002] It is well known, particularly in the field of transporting and using particulate materials, commonly powders, granules, pellets, and the like, that it is important to keep product particles as free as possible of contaminants. Particulates are usually transported within a facility where they are to be mixed, packaged or used in a pressurized tubular system that in reality produces a stream of material that behaves somewhat like a fluid. As these materials move through the pipes, considerable friction is generated not only among the particles themselves, but also between the tube walls and the particles in the stream. In turn, this friction results in the development of particle dust, broken particles, fluff, streamers (ribbon-like elements that can "grow" into quite long and tangled), glass fibers in glass filled products, that can impede the flow of materials or even totally block the flow. The characteristics of such a transport system are quite well known, as is the importance and value of keeping product particles as free as possible of contaminants.

[0003] The term "contaminant" as used herein includes a broad range of foreign material and includes foreign material as well as broken particles or streamers of the product being transported. The generation of contaminants, also referred to as dust, can be from a large number of sources, including, in the way of examples, the creation of dust particles during the processing of plastic pellets in which the larger particles are segregated to be re-ground; organic matter in food grains, such as shells and hulls; the creation of dust in the formation of iron ore pellets; and, as noted previously, the mere conveyance of the pellets in pipes and other mechanical conveying and handling systems. Using plastics as an example, such foreign material could have a detrimental effect on the finished product. Specifically, foreign material different in composition from the primary material, such as dust, and non uniform material of the primary product, such as streamers, would not necessarily have the same melting temperatures as the primary product and would cause flaws when the plastics material is melted and molded.

[0004] Considering product quality, and focusing on moldable plastics as a primary example, foreign material different in composition from the primary material, such as dust, non-uniform material of the primary product, fluff, and streamers, does not necessarily have the same melting temperatures as the primary product and causes flaws when the material is melted and molded. These flaws result in finished products that are not uniform in color, may contain bubbles, and often appear to be blemished or stained, and are, therefore, unsellable. It is important to note that since these same non-uniform materials often do not melt at the same temperature as the primary product, the unmelted contaminants cause friction and premature wear to the molding machines, resulting in downtime, lost production, reduced productivity, increased maintenance and thus increased overall production costs.

[0005] Since dust and other contaminants are generated mostly by the transport system, it is of primary importance to not only provide apparatus for thoroughly cleaning the particles, but to do so as close to the point of use of the particles as possible so as to avoid the generation of contaminants through additional transport. Accordingly, compact dedusters have been used for many years to clean materials in this application, capable of handling smaller volumes of product, yet also capable of thoroughly cleaning the product. The compact dedusters permit the installation of the deduster immediately before final use of the products, such as being installed directly on top of molding machines or extruders, or on top of silos, as well as under silos, rather than at an earlier stage after which re-contamination can occur before the products are utilized. Of course, the dedusters can be installed as a free standing unit, as well.

[0006] Dedusters used to clean contaminants from particulate material can be found in U.S. Pat. No. 5,035,331, granted to Jerome I. Paulson on Jul. 30, 1991, in which air is blown upwardly through wash decks over which a flow of contaminated particulate material is passed so that the flow of air up through the wash decks removes the contaminants from the material flow. A magnetic field is provided by the deduster so that the particulate material flow passes through the magnetic field to neutralize the static charge on the particulates and facilitate the removal of the contaminants from the material. The flow of contaminant laden air is discharged from the deduster, while the cleaned particulate material is passed on to the manufacturing process.

[0007] A compact dedusting apparatus is disclosed in U.S. Pat. No. 6,595,369, granted on Jul. 22, 2003, to Jerome I. Paulson. Like the larger dedusting apparatus depicted in U.S. Pat. No. 5,035,331, the follow of particulate material is cleansed of contaminates that have had the static charged attracting the contaminates to the particulates neutralized. The cleaning process utilizes a flow of air passing through the stream of particulate material passing over wash decks. The contaminate-laden air is discharged through the top of the dedusting apparatus, while the cleaned particulate material is discharged from the bottom of the deduster.

[0008] These compact dedusters are provided with a single wash deck bathed in a magnetic flux field to provide dual action cleaning that fluidizes the flow of particles over the wash deck and uses a counter current flow to dislodge dust particles from the product for discharge from the apparatus. The magnetic flux field extends on opposing sides of the magnetic flux field generator, as well as above and below the magnet. Accordingly, a single wash deck is utilizing only a quarter of the magnetic flux filed that is generated. Furthermore, a single wash deck is limited in capacity. A double wash deck configuration is known from the Pelletron Max Series dedusters, wherein back to back wash decks are provided with a lower dust air outlet having a deflector panel to minimize the inadvertent discharge of cleaned particles with the dust-laden air being discharged from the lower air outlets.

[0009] Dividing the flow of particulate material evenly over the oppositely directed double wash decks was enhanced by the use of a splitter that provided an edge extending into the infeed opening of the dedusting apparatus to split the inflowing particulate material into two oppositely directed streams. When the particulate material being fed into the dedusting apparatus had a lot of streamers, which are long strings of improperly formed particulate pellets, particularly found in plastic pellets, or in re-ground or soft plastic pellets, the

streamers would hang up on the edge of the splitter, resulting in uneven feeding of material between the two wash decks and sometimes a plugging of the infeed area. Furthermore, the prior art infeed mechanism would often suffer from an uneven, or even on-sided material flow due to the operation of a rotary valve which is typically used to meter the flow of particulate material into the dedusting apparatus.

[0010] Accordingly, it would be desirable to provide an infeed device that would not be subject to uneven flow characteristics or result in plastic streamers hanging up and not passing through the dedusting apparatus.

SUMMARY OF THE INVENTION

[0011] It is an object of the invention to overcome the disadvantages of the prior art by providing an infeed device for use in compact dedusting apparatus that have a double wash deck configuration.

[0012] It is another object of this invention to provide an effective infeed device that establishes an even flow divided between the opposing wash decks.

[0013] It is still another object of this invention to provide an infeed device that will not engage plastic streamers in the particulate material flow into the dedusting apparatus.

[0014] It is an advantage of this invention that the infeed device provides an even flow through the infeed device onto the wash decks.

[0015] It is a feature of this invention that the infeed device is formed with a reduced opening area at the discharge opening compared to the inlet opening.

[0016] It is another advantage of this invention that the infeed device funnels the particulate material into an oval-shaped opening to provide a constant flow onto the wash decks.

[0017] It is another feature of this invention that the configuration of the infeed device transitions the circular inlet opening into an oval shaped discharge opening to direct the flow of particulate material onto the wash decks.

[0018] It is still another advantage of this invention that the oval-shaped discharge opening is centrally positioned over the joinder of the opposing wash decks.

[0019] It is yet another feature of this invention that the joinder of the wash decks is blunted so as to not present an edge on which streamers can engage and hang up.

[0020] It is still another feature of this invention that the longitudinal length of the oval-shaped discharge opening of the infeed device is equal to the diameter of the inlet opening.

[0021] It is a further feature of this invention that the transverse width of the oval-shaped discharge opening of the infeed device is substantially smaller than the diameter of the inlet opening.

[0022] It is yet another advantage of this invention that infeed device distributes the incoming particulate material evenly to the entire wash deck area.

[0023] It is still a further feature of this invention that the infeed device can be formed as a separate insert member that can be placed in existing deduster infeed openings to convert the infeed configuration of existing dedusters.

[0024] It is a further advantage of this invention that the wide discharge opening of the infeed device allows the flow of regrind, soft pellets and particulate material with streamers to be fed onto the deduster wash decks without clogging.

[0025] It is still a further feature of this invention that the infeed device is formed with steep sides extending between the inlet opening and the discharge opening to prevent the particulate material being fed into the dedusting apparatus from bridging.

[0026] It is a further object of this invention to provide an infeed device for use in a double wash deck dedusting apparatus, which is durable in construction, inexpensive of manufacture, carefree of maintenance, facile in assemblage, and simple and effective in use.

[0027] These and other objects, features and advantages are accomplished according to the instant invention by providing an infeed device to improve the flow of particulate material into a double wash deck dedusting apparatus. The infeed device is formed with a circular inlet opening, an oval-shaped discharge opening and step sides interconnecting the inlet and discharge openings to prevent bridging in particulate material being fed through the infeed device onto the wash decks. The infeed device can be formed as a separate member that can be inserted into the infeed opening of existing dedusters. The oval-shaped discharge opening is substantially smaller transversely than the diameter of the inlet opening, but has a longitudinal length that is equal to the diameter of the inlet opening and equal to the longitudinal length of the wash decks. The joinder of the wash decks is blunted to eliminate a divider edge on which plastic streamers can hang up while being fed to the wash decks.

BRIEF DESCRIPTION OF THE DRAWINGS

[0028] The advantages of this invention will become apparent upon consideration of the following detailed disclosure of the invention, especially when taken in conjunction with the accompanying drawings wherein:

[0029] FIG. **1** is a front elevational view of a compact dedusting apparatus incorporating the principles of the instant invention, the infeed device being shown in dashed lines as a separate member that can be placed into a standard infeed opening of the dedusting apparatus;

[0030] FIG. **2** is a side elevational view of the compact dedusting apparatus depicted in FIG. **1**;

[0031] FIG. **3** is a top plan view of the compact dedusting apparatus depicted in FIG. **1**;

[0032] FIG. **4** is an enlarged partial front elevational view of the infeed area of the compact dedusting apparatus showing the relationship between the infeed device and the double wash deck configuration;

[0033] FIG. **5** is an enlarged top plan view of the infeed device;

[0034] FIG. **6** is an enlarged front elevational view of the infeed device shown in FIG. **5**; and

[0035] FIG. **7** is an enlarged side elevational view of the infeed device shown in FIG. **5**.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

[0036] The dedusting apparatus is known in the art. A description of the structure and operation of a dedusting apparatus and a compact dedusting apparatus can be found in U.S. Pat. No. 5,035,331 and in U.S. Pat. No. 6,595,369, both of which were issued to Jerome I. Paulson, the contents of each of these patents being incorporated herein by reference. Typical particulate material to be cleaned by the dedusting apparatus **10** is plastic pellets that are to be passed into an injection molding machine to form plastic components. Examples of plastic particulate material that can be cleaned of contaminate

material by the dedusting apparatus **10** are polyester, acrylic, high density polyethylene, polypropylene, nylon, polycarbonates, styrene, and low density polyethylene. Other types of particulate material that can be cleaned in the dedusting apparatus **10** include glass particles and grain.

[0037] Referring to FIGS. **1-3**, the dedusting apparatus **10** is connected to a vertical portion of a fluent material handling system (not shown) such that the particulate material is fed into a product inlet port **30** located at the top of an airtight casing **11**. The casing **11** has two subcomponents, a main housing **15** in which the wash decks apparatus **50**, as described below, is mounted, and an air flow passageway **16** primarily located behind the main housing **15**. The product inlet port **30** is in flow communication with the main housing **15** to direct product particulates onto the first wash deck **52** for cleaning. A magnetic coil **31** generating a flux field is mounted at the inlet port **30** so that the flow of particulate material into the housing **15** to be cleaned is subjected to the magnetic flux field to neutralize the static charges on the particulate pellets, thus making the separation of the contaminates from the pellets easier to accomplish. Air is fed into the casing **11** through a clean air inlet port **20** located in the lower part of the back of the casing **11**. As is described in greater detail in co-pending and co-owned U.S. patent application Ser. No. 11/454,437, the contents of which are incorporated herein by reference, the air is distributed through a clean air plenum **18** via internal passages to a first inlet opening **22** below the first wash decks **52** and to a second inlet opening **24** below the second wash decks **55**.

[0038] The casing **11** is formed with a back panel **12**, in which the clean air inlet port **20** and the dusty air discharge port **25** are located, and integral side, top and bottom panels that form a generally rectangular configuration. A removable front door **13** is connected to the remainder of the casing **11** by fasteners **13***a* to permit access into the wash deck apparatus **50** for service and maintenance thereof. An interior panel **14** oriented parallel to the back panel **12** and the front door **14** divides the casing **11** into a main housing **15** situated between the interior panel **14** and the front door **13** and an air flow passageway **16** situated between the back panel **12** and the interior panel **14**. A separator panel **17** divides the air flow passageway into a lower clean air plenum **18** and an upper dusty air plenum **19**, each of which being in flow communication with the respective clean air port **20** and the dusty air port **25**.

[0039] The configuration of the wash deck apparatus **50** is in a double set, oriented back-to-back such that the first wash decks **52** are angled downwardly at an incline of approximately 30 degrees from the horizontal in opposing transverse directions. The second wash decks **55** are positioned beneath the first wash decks **52** so as to receive the flow of product particles therefrom and convey the product over an inclined surface that is also oriented at about a 30 degree incline relative to the horizontal. The first wash decks **52** are formed in a central diamond-shaped assembly that includes a lower deck member **54** associated with each of the first wash decks **52**. The lower deck members **54** help define an air flow path that directs air transversely outwardly into Venturi zones **35** through which air is directed in a counter current flow to aggressively remove dust particles from the product.

[0040] Referring now to FIGS. **1-7**, to improve the flow of particulate material through the inlet opening **30** onto the first wash decks **52**, an inlet device **40** funnels the particulate material from the circular inlet opening **30** into an oval-shaped discharged opening **45** having rounded ends **47** and linear longitudinal sides **46**, which is centered over the joinder of the two opposing first wash decks **52**. The inlet device **40** can be formed as a separate, free-standing component that is placed into the conventional inlet structure **30** of the deduster **10**, or integrally formed as part of the inlet structure **30**. Further description of the inlet device **40** will be as a separate, free-standing component, which is the embodiment shown in the drawings.

[0041] The inlet device **40** is formed with a circular flange **41** that rests on top of the flange formed at the inlet opening structure **30** of the deduster **10**. One skilled in the art will recognize that the flange **41** and the flange of the inlet structure **30** would be the same component if the inlet device configuration **40** were integrally formed in the deduster **10**. The circular flange **10** encircles the inlet opening **42** for the inlet device **40** through which the particulate material would pass to the wash deck apparatus **50**. From the inlet opening **42**, the inlet device is formed with steep side walls **44** that are directed inwardly at the sides to form the oval-shaped discharge opening **45**. Accordingly, the discharge opening **45** has a longitudinal length that is substantially equal to the diameter of the inlet opening **42**, but has a transverse width dimension that is substantially smaller than the diameter of the inlet opening **42**.

[0042] This structural configuration forms a funnel structure that concentrates the flow of particulate material onto the first wash decks **52** at the joinder thereof. The steep side walls **44** are oriented from about a 75° vertical angle at the center of the longitudinal sides **44** to a 90° vertical angle at the rounded ends to prevent bridging of the particulate material being converged from the larger circular inlet opening **42** to the smaller oval-shaped discharge opening **45**. One skilled in the art will recognize that the vertical angle of the side walls will depend on the relative sizes of the diameter of the inlet opening and the transverse width of the discharge opening, as well as the vertical depth of the inlet device between the inlet and discharge openings, but should preferably be greater than about 60° at the center of the discharge opening **45** to prevent bridging of the particulate material.

[0043] To prevent the first wash decks **52** from having a sharp edge that would present structure on which streamers would hang up when fed through the inlet structure **30**, the joinder of the two opposing first wash decks **52** is preferably truncated to present a substantially flat landing **49** aligned with the center of the oval-shaped discharge opening **45**. With the use of the inlet device **40**, the deduster **10** does not utilize a splitter, as is described in the aforementioned U.S. patent application Ser. No. 11/454,437, thus further eliminating an edge on which streamers in the flow of particulate material could engage and potentially clog the inlet opening **30**.

[0044] The inlet device **40** thus presents a discharge opening **45** for the passage of particulate material onto the wash deck apparatus **50** that has a longitudinal length dimension that is substantially identical to the longitudinal length of the first wash decks **52**, but has a transverse width that focuses the particulate material discharged onto the wash deck apparatus **50** evenly onto the first wash decks **52**. The linear sides **46** of the discharge opening **45** direct the flow of material into a curtain-like pattern that falls uniformly along the first wash decks **52**, reducing the need for product deflectors as are shown and described in the aforementioned U.S. patent application Ser. No. 11/454,437.

[0045] Product to be cleaned is introduced into the housing **15** through the product inlet opening **30** at the center of the top portion of the housing **15**. The magnetic coil **31** is positioned around the product inlet port **30** to introduce a magnetic flux field which covers the entire housing **15**. The second air wash deck **55** is supported by the housing **15** in a downwardly directed incline opposite to that of the first air wash deck **52**, though also oriented at a minimum angle of 30 degrees to the horizontal. In other words, the second wash decks **55** are angled from both opposing sides to direct a flow of product particles toward the center where the product discharge port **34** is located. Pressurized air is introduced into the second air wash deck **55** from the second inlet openings **24** in the interior panel **14** located beneath the second wash decks **55** to pass upwardly through the second air wash deck **55** similarly to that described above with respect to the first air wash deck **52** to clean any remaining contaminates from the flow of particulate product directed onto the second air wash deck **55**.

[0046] The product particles moving off of the first wash deck **52** may have sufficient velocity, particularly due to the velocity boost generated by the ribbon of air passing through first wash decks **52**, that the product particles may impact a generally vertical deflector plate **36** defining the outboard sides of the Venturi zones **35**. Product deflected off of the deflector plates **36** are directed downwardly to the second air wash decks **55**. The product discharge port **34** is provided at the center of the housing **15** between the two second wash decks **55** to receive product from the second wash decks **55** for discharge from the housing **15**.

[0047] Air entering through the second inlet opening **24** is also directed behind the deflector plates **36** for use in adjusting the air flow in the Venturi zones **35**. The air flow chamber **39** extends rearwardly into the clean air plenum **18** rearwardly of the interior panel **14** to deliver air above the second wash decks **55** and behind the deflector plates **36**. An adjustment mechanism **38** is connected to each respective deflector plate **36**, which is pivotally mounted so that the bottom of each deflector plate **36** is movable into the corresponding Venturi zone **35**, to permit a flow of air past the bottom of the deflector plates **36** into the Venturi zones **35**, thus increasing the air flow through the Venturi zones **35**. The air flow through the wash decks **52**, **55** and through the Venturi zones **35** is directed upwardly toward the dusty air outlet openings **28**.

[0048] In operation, the dedusting apparatus **10** receives a volume of contaminated particulate material to be cleaned which is introduced into the product inlet port **30**. The particulate material passes through the magnetic flux field generated by magnetic coil **31** to disrupt the static charge attraction causing the contaminants to adhere to the individual particles of the particulate material. Material flow control is important in order to cause particulate particles to disperse in such a way that air can flow freely through the product stream so as to lift contaminants upward away from the product. The flow of material through into the dedusting apparatus **10** is controlled by the inlet device **40** and divided into laterally opposing flow paths onto the first air wash decks **52**.

[0049] The first air wash decks **52** separate small particles of 100 microns and less from the flow of particulate material thereon. The Venturi zones **35** (between the first air wash decks **52** and the deflector plates **36**), when adjusted correctly, will remove larger contaminants, thereby providing a two stage separation of contaminants as large as 1/52 of an inch. The particulate material is then passed across the second air wash decks **55** with residual contaminates being separated at this time. Finally, the cleaned product drops to the bottom of the main housing **15** and is discharged out of the dedusting apparatus **10** through the product outlet port **34**.

[0050] Because of the different characteristics of the various products that can be introduced into the apparatus **10** to be cleaned of dust particles, certain aspects of the apparatus are made adjustable, as is generally known in the art. For example, the deflector plates **36** forming the outboard sides of the respective Venturi zones **35** are preferably positionally adjustable so as to both change the physical dimensions of the Venturi zones **35**, which alone changes the velocity of the air flowing through the Venturi zones **35**, but also adds air flow past the deflector plates **36** into the Venturi zones **35**. Too much air and too great of a velocity for some products will increase the product carryover into the dusty air discharge openings. Under typical operating circumstances, the preferable pressure differential between the Venturi zones **35** and the dusty air discharge openings **28** is equal to about five inches of water.

[0051] It will be understood that changes in the details, materials, steps and arrangements of parts, which have been described and illustrated to explain the nature of the invention will occur to and may be made by those skilled in the art upon a reading of this disclosure within the principles of the scope of the invention. The foregoing description illustrates the preferred embodiment of the invention; however, concepts, as based upon the description may be employed in other embodiments without departing from the scope of the invention. Accordingly, the following claims are intended to protect the invention broadly, as well as in the specific form shown.

Having thus described the invention, what is claimed is:

1. A dedusting apparatus for removing dust particles from particulate product material, comprising:

a casing having a back panel, a front panel and an interior panel dividing the casing into a main housing and an air plenum behind the main housing, said air plenum being divided by a separator panel into a clean air plenum and a dusty air plenum;

a wash deck apparatus supported in the main housing and including:

a pair of first wash decks mounted to be inclined downwardly and outwardly in opposing lateral directions from a central axis;

a pair of lower deck members connected respectively to said first wash decks and oriented downwardly and inwardly toward said central axis to form a generally diamond-shaped configuration;

a pair of second wash decks oriented generally parallel to said lower deck members and being positioned respectively below said first wash decks to receive a flow of product material discharged from said first wash decks, each of said first and second wash decks having a plurality of holes and slots therein for the passage of air therethrough as product flow on top of the respective wash deck; and

a Venturi zone located at the end of each said first wash deck and bounded on each respective outboard side by a deflector plate;

a product inlet port connected in flow communication to said main housing at said central axis to introduce an inflow of particulate material to be cleaned to said first wash decks, said product inlet port directing the inflow of particulate material into a discharge opening having

linear longitudinally extending sides to direct the inflow of particulate material across a corresponding longitudinal dimension of said pair of first wash decks;

a product discharge port connected in flow communication to said main housing at said central axis between said second wash decks to receive particulate material from said second wash decks for discharge from said main housing;

a clean air inlet port connected in flow communication to said clean air plenum for the introduction of air under pressure into said clean air plenum so as to pass upwardly through said pair of first wash decks and said pair of second wash decks.

2. The dedusting apparatus of claim **1** further comprising a magnetic flux field generator mounted on said product inlet port to create a magnetic flux field to disrupt any static charges attracting the dust particles to the product particles.

3. The dedusting apparatus of claim **1** wherein said clean air plenum includes:

a first air inlet opening in said interior panel below said first wash decks and above said lower deck members to introduce a flow of air through said holes and slots in said first wash decks;

a pair of second air inlet openings in said interior panel below said second wash decks to introduce a flow of air through said holes and slots in said second wash decks; and

a Venturi flow chamber extending from below each said second wash deck and projecting rearwardly through said interior panel and terminating above the respective said second wash deck behind the corresponding said deflector plate to deliver a flow of air behind said deflector plates to enhance air flow in said respective said Venturi zone.

4. The dedusting apparatus of claim **1** wherein said product inlet port is formed with a generally circular inlet opening having a diameter dimension and an oval-shaped discharge opening including said linear sides spaced below said inlet opening, said discharge opening being centered over said pair of first wash decks.

5. The dedusting apparatus of claim **4** wherein said discharge opening is formed with rounded ends that define a longitudinal length dimension of said discharge opening, said longitudinal length dimension being substantially equal to said diameter dimension of said inlet opening.

6. The dedusting apparatus of claim **5** wherein said discharge opening has a transverse width dimension extending between said linear sides, said transverse width dimension being smaller than said diameter dimension of said inlet opening.

7. The dedusting apparatus of claim **6** wherein said product inlet port is formed with side walls extending between said inlet opening and said discharge opening to transition said circular inlet opening into said oval-shaped discharge opening, said discharge opening being spaced vertically from said inlet opening to establish steep side walls disposed at a vertical angle greater than sixty degrees.

8. The dedusting apparatus of claim **7** wherein said side walls have a vertical angle of about 75° at the center of the longitudinal sides and increasing to 90° at said rounded ends.

9. The dedusting apparatus of claim **6** wherein said pair of first wash decks are joined by a truncated portion that presents a generally horizontal surface beneath said discharge opening of said inlet device.

10. The dedusting apparatus of claim **9** wherein said truncated portion is positioned centrally with respect to said discharge opening and presents said generally horizontal surface with a transverse width dimension smaller than the corresponding transverse width dimension of said discharge opening.

11. The dedusting apparatus of claim **6** wherein said product inlet port is formed as a separate component that is removable from said main housing.

12. An inlet device for a dedusting apparatus for removing dust and debris from particulate material, said dedusting apparatus including a pair of oppositely oriented wash decks positioned below an inlet port of said dedusting apparatus, comprising:

a generally circular flange defining an inlet opening; and

side walls extending downwardly from said flange and defining an oval-shaped discharge opening centered over said wash decks and having generally linear longitudinally extending sides and rounded ends.

13. The inlet device of claim **12** wherein said inlet opening has a diameter dimension and said discharge opening has a longitudinal length dimension extending between said rounded ends, said longitudinal length dimension being substantially equal to said diameter dimension of said inlet opening.

14. The inlet device of claim **13** wherein said discharge opening has a transverse width dimension extending between said linear sides, said transverse width dimension being smaller than said diameter dimension of said inlet opening.

15. The inlet device of claim **14** wherein said side walls transition said circular inlet opening into said oval-shaped discharge opening, said discharge opening being spaced vertically from said inlet opening to establish steep side walls disposed at a vertical angle of about 75° at the center of the longitudinal sides and increasing to 90° at said rounded ends.

16. The dedusting apparatus of claim **14** wherein said wash decks are joined by a truncated portion that presents a generally horizontal surface beneath said discharge opening of said inlet device, said truncated portion being positioned centrally with respect to said discharge opening and presenting said generally horizontal surface with a transverse width dimension smaller than the corresponding transverse width dimension of said discharge opening.

17. In a dedusting apparatus for removing dust and debris from particulate material, said dedusting apparatus including a pair of oppositely oriented wash decks positioned below an inlet port of said dedusting apparatus, the improvement comprising:

an inlet device having a generally circular flange defining an inlet opening and side walls extending downwardly from said flange to define an oval-shaped discharge opening centered over said wash decks, said discharge opening having generally linear longitudinally extending sides and rounded ends.

18. The dedusting apparatus of claim **17** wherein said inlet opening has a diameter dimension, said discharge opening has a longitudinal length dimension extending between said rounded ends and a transverse width dimension extending between said linear sides, said longitudinal length dimension being substantially equal to said diameter dimension of said inlet opening, while said transverse width dimension is smaller than said diameter dimension of said inlet opening.

19. The inlet device of claim **18** wherein said side walls transition said circular inlet opening into said oval-shaped

discharge opening, said discharge opening being spaced vertically from said inlet opening to establish steep side walls disposed at a vertical angle greater than 60° at the center of the longitudinal sides and increasing to 90° at said rounded ends.

20. The dedusting apparatus of claim **19** wherein said wash decks are joined by a truncated portion that presents a generally horizontal surface beneath said discharge opening of said inlet device, said truncated portion being positioned centrally with respect to said discharge opening and presenting said generally horizontal surface with a transverse width dimension smaller than the corresponding transverse width dimension of said discharge opening.

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