

Description

This invention relates to filter apparatus of the type having elongate tubular filter bags for removing particulate material from a moving air or gas stream. More particularly, the invention is concerned with an improved air diffuser construction positioned in an elongate supporting cage which supports a surrounding tubular filter bag thereon.

In United States Patent No. 4,231,770, granted November 4, 1980 there is disclosed a technique for cleaning gas permeable filter bags which normally collect dust, soot and other particulate material on the exterior surfaces thereof as the filtered air is exhausted through the open outlet ends of the filter bags, and wherein in addition to the usual tubular supporting cage within each tubular filter bag, a hollow, perforated, air diffuser tube is provided which extends longitudinally within each cage and the respective filter bag and communicates with the outlet end of the bag so that, when a periodic reverse purge flow of air is directed into the outlet end of the filter bag, the air is diffused by the diffuser tube and more uniformly distributed throughout the filter bag. Such more uniform distribution of the reverse purge air flow results in highly effective cleaning of the filter bag while also reducing excessive flexing of the filter bag and reducing abrasive wear thereof, thereby increasing the efficiency of the filter apparatus and significantly increasing the life of the filter bag.

In the early development of the air diffuser of said patent, perforated air diffuser tubes of convolute form were used, i.e., they were made from a perforated metal sheet whose opposite longitudinal edges were overlapped and interconnected, as by welding and/or riveting to form a seam extending along the length of and parallel to the axis of the diffuser tube. While convolute air diffuser tubes have performed quite well for diffusing and distributing the reverse purge flow of air throughout the respective filter bags during the cleaning operations, it has been found that since the longitudinal seam of each of such convolute air diffuser tubes is imperforate, the seam tends to "blank out" or inhibit the flow of the reverse purge of air outwardly along an adjacent narrow area of the length of the respective tubular filter bag. Also, since it is desirable that the diffuser tube is provided throughout with relatively small, closely spaced perforations, it has been necessary to construct such convolute diffuser tubes of relatively heavy gauge sheet metal so that they would not bend easily or become damaged otherwise in the normal handling of the same during their manufacture, storage, and installation.

Accordingly, it is an object of this invention to provide a filter apparatus of the type described with air diffuser tubes of improved rigidity and stability and which substantially eliminates the "blank-out" problem presented by the longi-

tudinal seams of the convolute air diffuser tubes used heretofore.

According to the invention, there is provided a filter apparatus of the type having at least one tubular filter bag through which a particulate-laden gas is directed for filtering and retaining the particular material on the exterior of the bag as the filtered gas is discharged through the outlet end of the bag, wherein the filter bag is supported by a tubular supporting cage positioned within the filter bag, wherein a hollow air diffuser tube extends longitudinally within the tubular supporting cage and is in communication with the outlet end of the filter bag, and the filter bag is cleaned by a periodic reverse purge of air directed into the outlet end of the filter bag so that the hollow air diffuser tube diffuses and distributes the thus directed air, characterized in that the hollow air diffuser tube is formed from a perforated strip of helically wound sheet metal, with adjacent edges of the sheet metal strip being interconnected by a seam in which said adjacent edges overlap each other in interlocking relationship and form an imperforate reinforced seam, with the seam thus extending helically around the air diffuser tube. The purpose of this seam is to structurally reinforce the tube circumferentially and avoid the presence of a significant air flow obstructing imperforate linear area extending along the length of the tube.

Thus, the seam extends helically around the air diffuser tube and provides a thickened area to impart rigidity and strength to the air diffuser tube. This permits the use of a relatively thin gauge sheet metal in the manufacture of the air diffuser tube, whilst providing improved rigidity and stability for more effectively retaining the tube shape and integrity during normal handling and use, and furthermore enabling the product to be manufactured more economically.

The invention will be more readily understood with reference to the accompanying drawings, in which:

Figure 1 is a schematic vertical sectional view through a filter apparatus of the type employing a plurality of bag-type tubular filters;

Figure 2 is a side elevation of a bag-type filter assembly, partially in section, and illustrating the filter bag, its supporting cage, and the hollow diffuser tube embodying the present invention;

Figure 3 is a fragmentary elevation of a portion of a perforated strip of sheet metal employed in forming the improved hollow air diffuser tube embodying the present invention;

Figure 4 is an enlarged fragmentary elevational view of a medial portion of the air diffuser tube shown in Figure 2;

Figure 5 is a fragmentary longitudinal sectional view through the wall of the air diffuser tube taken substantially along line 5-5 in Figure 4; and

Figure 6 is an enlarged fragmentary view of a preferred form of the seam interconnecting adjacent edges of the perforated strip of helically

wound sheet metal forming the improved hollow air diffuser tube.

Referring more specifically to the drawings, there is shown in Figure 1 a conventional filter apparatus of the type utilizing elongate bag-like tubular filters, which filter apparatus includes a filter housing 10, generally known as a "bag-house," which is divided by a substantially horizontal wall 11 into a lower filtering chamber 12 and an upper filtered air chamber or plenum 13. A plurality of elongate, hollow, tubular filter bags 14 are mounted in the filtering chamber 12 in a generally vertical orientation with the upper ends thereof supportingly carried by the horizontal dividing wall 11. The upper ends of the respective filter bags 14 communicate with the filtered air plenum 13 via holes provided in wall 11.

As shown, particulate-laden gas is directed into the filtering chamber 12 through an air inlet duct 15, where it passes around the respective filter bags 14 and then flows through the gas permeable filter bags while the particulate material is filtered and retained on the exterior surface of the filter bags. After passing into the hollow interior of the filter bags 14, the filtered gas passes upwardly through the outlet ends of the respective bags and into the filtered air plenum 13. The thus-filtered gas is directed from the filtered air plenum 13 outwardly through an outlet duct 16.

As the particulate material accumulates on the exterior surfaces of the filter bags 14, it becomes necessary to clean the filter bags by dislodging the accumulated particulate material therefrom. This is accomplished by periodically directing a purging reverse flow of air through the filter bags 14. As disclosed in said United States Patent No. 4,231,770, the reverse purge flow of air may be effected simply by periodically directing compressed air into the filtered air plenum 13 while blocking the flow of air from the plenum into the outlet duct 16 so that the compressed air is directed in a reverse direction into the outlet ends of the respective filter bags 14. In the illustrated filtering apparatus, purge air from a compressed air source 17 is directed, in the form of individual jets of air, into the open upper ends of the filter bags 14 via respective nozzles 20 connected to the source of compressed air 17 by control valves 21. The control valves 21 are normally closed and are periodically momentarily opened by a suitable control means 22. The particulate material dislodged from the filter bags 14 may be accumulated in the lower portion of the filter housing 10 and removed by any suitable means such as a screw conveyor 23.

Figure 2 illustrates the various components of a filter assembly. As illustrated, each elongate tubular filter bag 14 is made of a gas permeable fabric and in a form somewhat similar to a sock, having one open end and one closed end. The filter assembly also includes an elongate tubular supporting frame 26, commonly termed a "cage." The supporting frame or cage 26 is of openwork construction for readily allowing the flow of air

therethrough, and is typically formed of heavy wire. The cage 26 has an outwardly extending rim or flange 27 at its upper portion for securing the cage to the substantially horizontal wall 11 of the filter housing; and the lower end of the cage 26 may be closed by an end plate, not shown. As is further disclosed in said United States Patent No. 4,231,770, the cage 26 is adapted to be positioned inside the respective tubular filter bag 14 so as to hold the filter bag in an open tubular configuration and prevent it from collapsing upon itself during the filtering operation as the particulate-laden gas passes inwardly therethrough.

To aid in effectively cleaning each filter bag, an improved hollow, perforated air diffuser tube 30 is provided within each tubular cage 26. The air diffuser tube 30 embodying the present invention serves the same purpose as the air diffuser tube of said United States Patent No. 4,231,770, but is of improved construction to lend rigidity and stability thereto and to substantially eliminate the "blank-out" problem presented by the longitudinal seams of the convolute air diffuser tubes used heretofore.

As illustrated, the air diffuser tube 30 is of a size adapted for being readily received longitudinally within the hollow cage 26. The diffuser tube 30 preferably is provided with an out-turned lip or flange 31 on its upper end to assist to mounting the diffuser tube in place within the tubular supporting cage 26. Preferably, the diameter of the diffuser tube 30 is as large as possible for maximizing the cross-sectional area of the diffuser tube while still allowing sufficient clearance between the diffuser tube and the cage 26 to permit inserting the same into position within the cage 26 and so that the diffuser tube will be substantially out of contact with the surrounding cage 26 and the filter bag 14. For example, in a typical filter assembly an air diffuser tube 30 having an outside diameter of about three and one-half inches (88.9 mm) was used with a filter bag 14 about four inches (101.6 mm) in diameter.

As shown in Figure 2, the air diffuser tube 30 is of a length somewhat less than the overall length of the supporting cage 26 with the lower end as well as the upper end of the diffuser tube 30 being open. Most desirably, the diffuser tube 30 should have a length about two-thirds to three-fourths the overall length of the cage 26. However, it has been determined that lengths considerably less than these preferred lengths still provide very beneficial results as compared to the results obtained in accordance with prior art arrangements wherein no diffuser tube was employed.

As set forth in said United States Patent No. 4,231,770, it has been determined that one of the primary reasons for the ineffective cleaning of the conventional filter bag arrangement is that the pulse or blast of reverse purge air was concentrated in the area adjacent where it entered the interior of the filter, namely, adjacent the outlet end of the filter. The effect of the reverse purge was substantially dissipated at the far end of the filter from the air outlet. Thus, while the outlet end

of the filter was being acted upon by the reverse purge of air, and in fact may have actually been overcleaned, the far end of the filter was essentially left uncleaned. As a result, the entire length of the filter bag was not being effectively utilized for filtration and the efficiency of the filter was diminished accordingly. The hollow perforated diffuser tube of said patent, as well as the diffuser tube embodying the present invention, perform the desired function of diffusing and distributing the pulse or blast of cleaning air over the entire filter bag to thus provide much more effective and efficient cleaning of the filter bag.

In order to lend rigidity and stability to the air diffuser tube while substantially eliminating the "blank-out" problem presented by the longitudinal seams of the convolute air diffuser tubes used heretofore, the hollow air diffuser tube 30 embodying the present invention is formed from a perforated strip of helically wound sheet metal. A portion of such strip is indicated at 34 in Figure 3 in its condition prior to having been formed into the air diffuser tube 30, for the purpose of illustrating that the strip 34 is provided with marginal imperforate areas or edge portions along its opposite longitudinal side edges 34a. The remaining major portion of the width of the strip 34 is perforated with relatively small perforations 35 therein arranged in transverse rows in relatively closely spaced relationship and with the perforations 35 in alternate transverse rows being arranged in staggered relation to the perforations 35 in the intervening rows between such alternate rows to permit the rows of perforations to be located relatively close together without unduly weakening the diffuser tube. Although the size of the perforations is not critical, holes or perforations 35 of about one-eighth inch (3.175 mm) diameter may be provided, for example, in strip 34. In this regard, by way of example, a sheet metal strip 34 of about a six inch (152.4 mm) width such as that shown in Figure 3, and from which a typical three and one-half inch (88.9 mm) diameter air diffuser tube 30 was made, had one-eighth inch (3.175 mm) diameter perforations 35 therein arranged in transverse rows whose centers were spaced about three-sixteenths of an inch (4.762 mm) apart, and the center-to-center distance between each adjacent pair of perforations 35 in each transverse row also was about three-sixteenths of an inch (4.762 mm).

Referring now to Figures 4, 5 and 6, it can be seen that adjacent edges 34a of the strip 34 are interconnected by a seam broadly designated at 36 and in which seam adjacent edges of the strip 34 overlap each other in interlocking relationship, with the seam 36 thus extending helically around the air diffuser tube from one end thereof to the other. As best shown in Figures 5 and 6, it can be observed that the seam 36 is formed of the marginal imperforate areas or edge portions of the adjacent edges 34a of the strip 34, with such portions being folded upon themselves and being positioned in interlocking relationship. However, it is to be noted that the inner surface of the air

diffuser tube 30 is substantially smooth throughout the length of the tube with the helically extending interlocking portions of the strip forming the seam 36 thereof projecting outwardly of, but not inwardly of, the diffuser tube, to provide a thickened area to impart rigidity to the air diffuser tube 30 and thereby lend strength against collapsing of the tube 30.

To further enhance the strength of the improved air diffuser tube 30, it is desirable that the width of the perforated strip 34, as viewed in Figure 3, is such that the lead of the helix or pitch defined by the helical seam 36 is no more than about twice the diameter of the tube 30 so as to impart substantial compressive resistance strength to the tube. Further, the minimum width of the strip 34 and the lead of the helix defined by the seam 36 should be sufficient so that adjacent turns of the seam 36 are not positioned in such close relationship as to unduly impede the flow of air through the tube wall. A typical air diffuser tube 30 embodying the present invention was about three and one-half inches (88.9 mm) in diameter formed from a metal perforated strip 34 about six inches (152.4 mm) wide, with the seam 36 being about five-sixteenths inch (7.938 mm) wide and the lead of the helix being about five and one-half inches (139.7 mm).

It is apparent that those edge portions or marginal areas of adjacent edges 34a of the strip 34 defining the seam are substantially or entirely imperforate throughout the seam 36, thus further enhancing the strengths imparted to the air diffuser tube 30 by the helical seam 36. It can be appreciated that the perforations 35 in the strip 34 are relatively small and are distributed generally uniformly throughout the length of and a major portion of the width of the strip 34, but excluding those portions of adjacent edges of the strip 34 forming the seam 36.

Since the perforations 35 are formed in transverse rows in the strip 34, as in Figure 3, prior to the strip 34 being formed into the spiral or helical tube 30, it can be appreciated, by referring to Figure 4, that the perforations are arranged in rows which extend diagonally to the longitudinal axis of the air diffuser tube 30.

It is thus seen that the overlapping and interlocking edges of the strip 34 form an imperforate helical seam which structurally reinforces the tube circumferentially and avoids the presence of an air flow obstructing imperforate linear area extending along the length of the tube as in prior art air diffuser tube constructions of convolute form. It has been determined that helically wound sheet metal air diffuser tubes embodying the present invention have improved characteristics of rigidity and stability even when made from relatively lightweight sheet metal as compared to the heavier weight of the sheet metal of which convolute wound diffuser tubes have been made heretofore in order to obtain the desired rigidity and stability thereof.

For example, heretofore a typical convolute wound three and one-half inch (88.9 mm) diam-

eter air diffuser tube was formed from 24 gauge stainless steel sheet metal having a thickness of about 0.0235 inch (0.597 mm) and weighing about 0.978 pound per square foot (4.77 Kg/m²). The same size air diffuser tube embodying this invention to form a helically wound diffuser tube was formed from relatively lightweight 28 gauge stainless steel metal, i.e., approximately 0.015 inch (0.381 mm) thick and weighing approximately 0.630 pound per square foot (3.07 Kg/m²). Thus, it can be appreciated that the helically wound sheet metal air diffuser tube was formed of metal of about one third less thickness and weight as compared to the same size convolute air diffuser tubes, but at the same time readily exhibited enhanced rigidity and stability over such convolute tubes. This improved rigidity of these helically wound tubes was readily evident visually by handling the tubes and attempting to manually squeeze, depress or distort the same so as to form indentations therein. Considerable resistance in the helically wound tube to such pressures were present, indeed, strikingly so, as compared to the heavier weight, greater thickness metal tubes of convolute construction. For example, the convolute tube appeared to present very little resistance to caving in from relatively mild squeezing pressure exerted by one's hands. On the other hand, the helically wound tube could only be distorted or caved in upon manual pressures being exerted thereon considerably above the forces that readily caved in the convolute tube.

Thus, it can be appreciated that the helically wound sheet metal air diffuser tube embodying the present invention is of improved construction even though formed of lighter weight metal such lighter weight metal therefore substantially reducing the cost of manufacture and facilitating the handling, shipping and installing of the tubes, particularly as compared to the heavier convolute air diffuser tubes used heretofore.

In the drawings and specification there has been set forth a preferred embodiment of the invention and although specific terms are employed, they are used in a generic and descriptive sense and not for purposes of limitation, the scope of the invention being defined in the claims.

Claims

1. A filter apparatus of the type having at least one tubular filter bag (14) through which a particulate-laden gas is directed for filtering and retaining the particulate material on the exterior of the bag as the filtered gas is discharged through the outlet end of the bag, wherein the filter bag (14) is supported by a tubular supporting cage (26) positioned within the filter bag (14), wherein a hollow air diffuser tube (30) extends longitudinally within the tubular supporting cage (26) and is in communication with the outlet end of the filter bag, and the filter bag is cleaned by a periodic reverse purge of air directed into the outlet end of the filter bag so that the hollow air

diffuser tube (30) diffuses and distributes the thus directed air characterized in that the hollow air diffuser tube (30) is formed from a perforated strip (34) of helically wound sheet metal, with adjacent edges (34a) of the sheet metal strip being interconnected by a seam (36) in which said adjacent edges overlap each other in interlocking relationship and form an imperforate reinforced seam, with the seam thus extending helically around the air diffuser tube (30).

2. A filter apparatus according to Claim 1, characterized in that the perforations (35) in said strip (34) are relatively small and are distributed generally uniformly through the length and a major portion of the width of said strip but excluding those portions of adjacent edges (34a) of said strip (34) forming said seam (36).

3. A filter apparatus according to claim 1 or 2, characterized in that the perforations (35) are arranged in rows.

4. A filter apparatus according to claim 3, characterized in that the perforations (35) in alternate rows are staggered relative to the perforations in intervening rows to permit the rows of perforations to be located relatively close together without unduly weakening the diffuser tube.

5. A filter apparatus according to claim 3 or 4, characterized in that the rows of perforations extend diagonally to the longitudinal axis of said air diffuser tube (30).

6. A filter apparatus according to any one of claims 1 to 5, characterized in that the sheet metal of said strip (34) is about 0.015 inch (0.381 mm) thick, and the lead of the helix defined by said seam (36) is no more than about twice the diameter of said air diffuser tube (30).

7. A filter apparatus according to any one of claims 1 to 6, characterized in that said air diffuser tube (30) is substantially smooth interiorly throughout its length, and said helically extending seam (36) projects outwardly of said diffuser tube.

Patentansprüche

1. Filtervorrichtung mit wenigstens einer rohrförmigen Filtertasche (14), durch welche partikelbeladenes Gas zum Filtern und Zurückhalten des Partikelmaterials auf dem Äußeren der Filtertasche geführt wird, wenn das gefilterte Gas durch das Auslaßende der Tasche ausgetragen wird, wobei die Filtertasche (14) durch einen in der Tasche (14) positionierten, rohrförmigen Stützkäfig (26) abgestützt ist, wobei sich ein hohles Luftdiffusorrohr (30) in Längsrichtung innerhalb der rohrförmigen Stützkäfigs (26) erstreckt und mit dem Auslaßende der Filtertasche kommuniziert und wobei die Filtertasche durch einen periodischen Umkehrluftstoß gereinigt wird, der in das Auslaßende der Filtertasche gerichtet wird, so daß das hohle Luftdiffusorrohr (30) die gerichtete Luft diffundiert und verteilt, dadurch gekennzeichnet, daß das hohle Luftdiffusorrohr (30) aus einem perforierten Streifen (34) aus wendelförmig

eter air diffuser tube was formed from 24 gauge stainless steel sheet metal having a thickness of about 0.0235 inch (0.597 mm) and weighing about 0.978 pound per square foot (4.77 Kg/m²). The same size air diffuser tube embodying this invention to form a helically wound diffuser tube was formed from relatively lightweight 28 gauge stainless steel metal, i.e., approximately 0.015 inch (0.381 mm) thick and weighing approximately 0.630 pound per square foot (3.07 Kg/m²). Thus, it can be appreciated that the helically wound sheet metal air diffuser tube was formed of metal of about one third less thickness and weight as compared to the same size convolute air diffuser tubes, but at the same time readily exhibited enhanced rigidity and stability over such convolute tubes. This improved rigidity of these helically wound tubes was readily evident visually by handling the tubes and attempting to manually squeeze, depress or distort the same so as to form indentations therein. Considerable resistance in the helically wound tube to such pressures were present, indeed, strikingly so, as compared to the heavier weight, greater thickness metal tubes of convolute construction. For example, the convolute tube appeared to present very little resistance to caving in from relatively mild squeezing pressure exerted by one's hands. On the other hand, the helically wound tube could only be distorted or caved in upon manual pressures being exerted thereon considerably above the forces that readily caved in the convolute tube.

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diffuser tube (30) diffuses and distributes the thus directed air characterized in that the hollow air diffuser tube (30) is formed from a perforated strip (34) of helically wound sheet metal, with adjacent edges (34a) of the sheet metal strip being interconnected by a seam (36) in which said adjacent edges overlap each other in interlocking relationship and form an imperforate reinforced seam, with the seam thus extending helically around the air diffuser tube (30).

2. A filter apparatus according to Claim 1, characterized in that the perforations (35) in said strip (34) are relatively small and are distributed generally uniformly through the length and a major portion of the width of said strip but excluding those portions of adjacent edges (34a) of said strip (34) forming said seam (36).

3. A filter apparatus according to claim 1 or 2, characterized in that the perforations (35) are arranged in rows.

4. A filter apparatus according to claim 3, characterized in that the perforations (35) in alternate rows are staggered relative to the perforations in intervening rows to permit the rows of perforations to be located relatively close together without unduly weakening the diffuser tube.

5. A filter apparatus according to claim 3 or 4, characterized in that the rows of perforations extend diagonally to the longitudinal axis of said air diffuser tube (30).

6. A filter apparatus according to any one of claims 1 to 5, characterized in that the sheet metal of said strip (34) is about 0.015 inch (0.381 mm) thick, and the lead of the helix defined by said seam (36) is no more than about twice the diameter of said air diffuser tube (30).

7. A filter apparatus according to any one of claims 1 to 6, characterized in that said air diffuser tube (30) is substantially smooth interiorly throughout its length, and said helically extending seam (36) projects outwardly of said diffuser tube.

Patentansprüche

1. Filtervorrichtung mit wenigstens einer rohrförmigen Filtertasche (14), durch welche partikelbeladenes Gas zum Filtern und Zurückhalten des Partikelmaterials auf dem Äußeren der Filtertasche geführt wird, wenn das gefilterte Gas durch das Auslassende der Tasche ausgetragen wird, wobei die Filtertasche (14) durch einen in der Tasche (14) positionierten, rohrförmigen Stützkäfig (26) abgestützt ist, wobei sich ein hohles Luftdiffusorrohr (30) in Längsrichtung innerhalb der rohrförmigen Stützkäfigs (26) erstreckt und mit dem Auslassende der Filtertasche kommuniziert und wobei die Filtertasche durch einen periodischen Umkehrluftstoß gereinigt wird, der in das Auslassende der Filtertasche gerichtet wird, so daß das hohle Luftdiffusorrohr (30) die gerichtete Luft diffusiert und verteilt, dadurch gekennzeichnet, daß das hohle Luftdiffusorrohr (30) aus einem perforierten Streifen (34) aus wendelförmig



(15)

gewickeltem Blechmetall gebildet ist, daß die benachbarten Ränder (34a) des Blechmetallstreifens durch eine Falzverbindung (36) miteinander verbunden sind, wobei sich die benachbarten Ränder in ineinandergreifender Beziehung einander überlappen und einen nichtperforierten, verstärkten Falz bilden, der sich somit wendelförmig um das Luftdiffusorrohr (30) erstreckt.

2. Filtervorrichtung nach Anspruch 1, dadurch gekennzeichnet, daß die Perforationen (35) in dem Streifen (34) relativ klein und im allgemeinen gleichmäßig über die Länge und einen Hauptteil der Breite des Streifens verteilt sind, ausgenommen solche Bereiche der benachbarten Ränder (34a) des Streifens (34), die den Falz (36) bilden.

3. Filtervorrichtung nach Anspruch 1 oder 2, dadurch gekennzeichnet, daß die Perforationen (35) in Reihen angeordnet sind.

4. Filtervorrichtung nach Anspruch 3, dadurch gekennzeichnet, daß die Perforationen (35) in wechselnden Reihen relativ zu den Perforationen in den dazwischenliegenden Reihen versetzt angeordnet sind, damit die Perforationsreihen relativ nahe beieinander angeordnet werden können, ohne das Diffusorrohr unnötig zu schwächen.

5. Filtervorrichtung nach Anspruch 3 oder 4, dadurch gekennzeichnet, daß sich die Perforationsreihen diagonal zur Längsachse des Luftdiffusorrohrs (30) erstrecken.

6. Filtervorrichtung nach jedem der Ansprüche 1 bis 5, dadurch gekennzeichnet, daß das Blechmetall des Streifens (34) etwa 0,015 Zoll (0,381 mm) dick ist und daß die Steigung der durch den Falz (36) definierten Wendel nicht größer ist als das Doppelte des Durchmessers des Luftdiffusorrohrs (30).

7. Filtervorrichtung nach jedem der Ansprüche 1 bis 6, dadurch gekennzeichnet, daß das Luftdiffusorrohr (30) im Innern über seine Länge im wesentlichen eben bzw. glatt ist und daß der sich wendelförmig erstreckende Falz (36) vom Diffusorrohr nach außen vorsteht.

Revendications

1. Appareil de filtration du type comportant au moins une manche filtrante tubulaire (14) à travers laquelle un gaz chargé de particules est dirigé pour filtrer et retenir la matière particulaire sur la surface externe de la manche alors que le gaz filtré est évacué par l'extrémité de sortie de la manche, la manche filtrante (14) étant supportée

par une cage de support tubulaire (26) qui est placée à l'intérieur de cette manche filtrante (14); un tube diffuseur d'air creux (30) s'étendant longitudinalement dans la cage de support tubulaire (26) et communiquant avec l'extrémité de sortie de la manche filtrante et la manche filtrante étant nettoyée par un flux inverse d'air de purge périodique introduit dans l'extrémité de sortie de la manche filtrante de telle sorte que le tube diffuseur d'air creux (30) diffuse et répartisse l'air ainsi dirigé, caractérisé en ce que le tube diffuseur d'air creux (30) est fait d'une bande perforée (34) de tôle enroulée en hélice, les bords adjacents (34a) de la bande de tôle étant réunis par un joint (36) dans lequel les bords adjacents se chevauchent et s'agrafent l'un à l'autre pour former un joint renforcé imperforé, le joint s'étendant donc en hélice autour du tube de diffuseur d'air (30).

2. Appareil de filtration suivant la revendication 1, caractérisé en ce que les perforations (35) dans la bande sont relativement petites et sont réparties d'une manière générale uniformément sur toute la longueur et sur une majeure partie de la largeur de la bande, à l'exclusion des parties marginales adjacentes (34a) de la bande (34) qui forment le joint (36).

3. Appareil de filtration suivant la revendication 1 ou 2, caractérisé en ce que les perforations (35) sont disposées en rangées.

4. Appareil de filtration suivant la revendication 3, caractérisé en ce que les perforations (35) d'une rangée sur deux sont décalées en quinconce par rapport aux perforations des rangées intermédiaires ce qui permet de placer les rangées de perforations relativement les unes près des autres sans affaiblir excessivement le tube diffuseur.

5. Appareil de filtration suivant la revendication 3 ou 4, caractérisé en ce que les rangées de perforations s'étendent obliquement par rapport à l'axe longitudinal du tube diffuseur d'air (30).

6. Appareil de filtration suivant l'une quelconque des revendications 1 à 5, caractérisé en ce que la tôle de la bande (34) a environ 0,015 pouce (0,381 mm) d'épaisseur et le pas de l'hélice défini par le joint (36) n'est pas supérieur à environ le double du diamètre du tube diffuseur d'air (30).

7. Appareil de filtration suivant l'une quelconque des revendications 1 à 6, caractérisé en ce que le tube diffuseur d'air (30) est en substance lisse intérieurement sur toute sa longueur et le joint hélicoïdal (36) fait saillie sur l'extérieur du tube diffuseur.



* C L M S *