Nov. 17, 1959 J. R. ROBERTS 2,912,723

METHOD OF AND MEANS FOR FELTING WITH VARIABLE SUCTION

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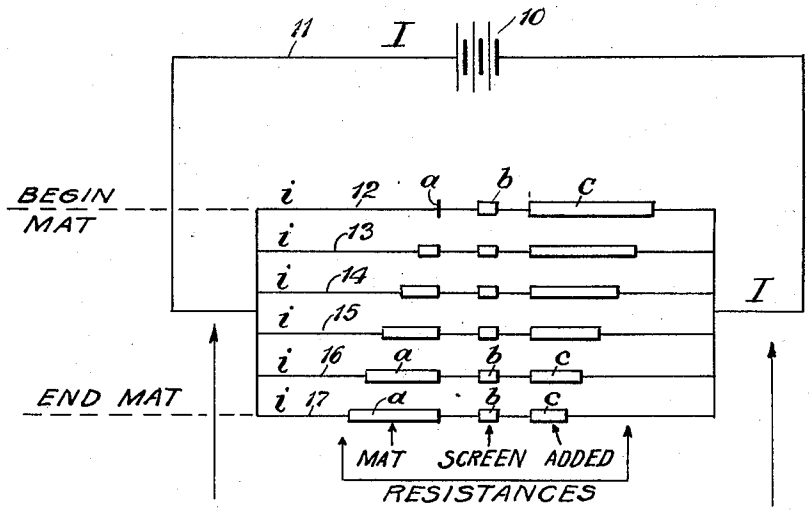



Fig. 1

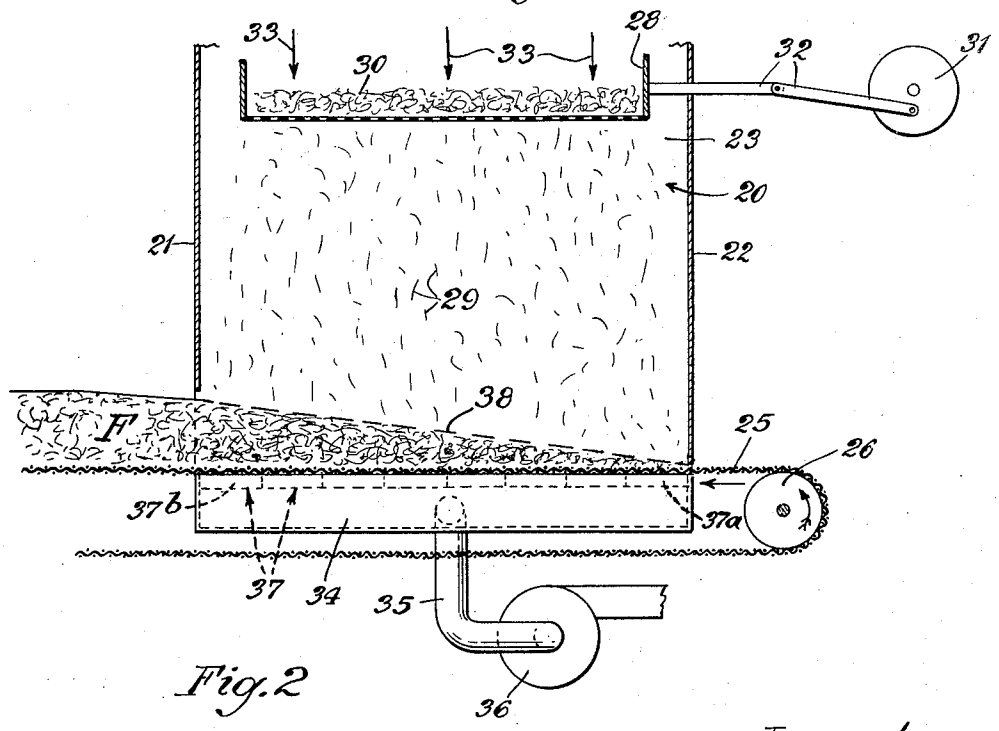



Fig. 2

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Fig. 3

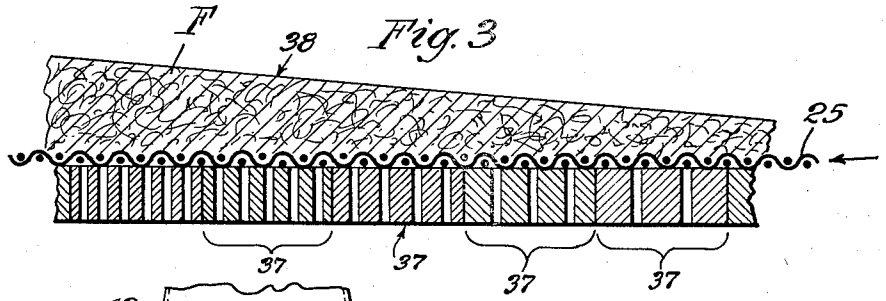



Fig. 4

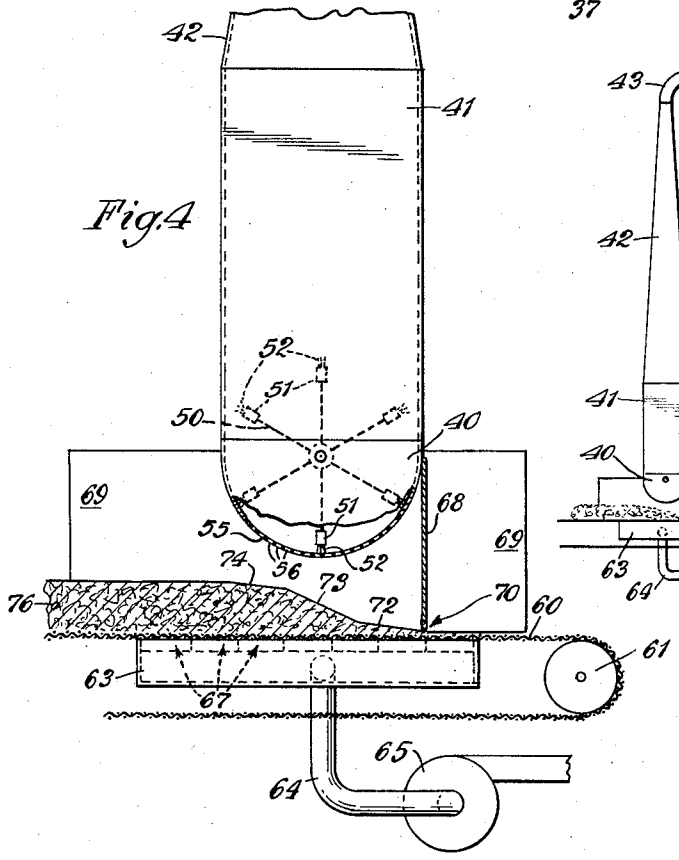
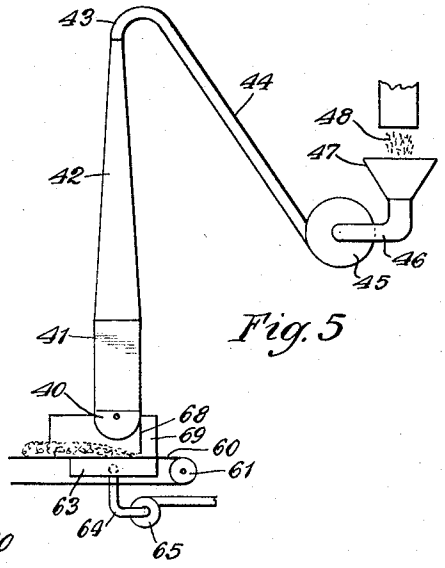



Fig. 5



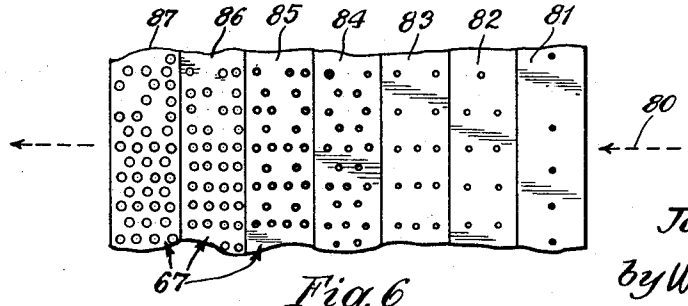




Fig. 6

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2,912,723

# METHOD OF AND MEANS FOR FELTING WITH VARIABLE SUCTION

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18 Claims. (Cl. 19—156)

The present invention relates generally to felting fibers from gaseous suspension onto a continuously moving filtering conveyer passing through a deposition area. In particular it relates to such felting by differential air pressure on the two sides of the conveyer, for example subatmospheric pressure on one side and atmospheric or superatmospheric pressure on the other.

Fibers have long been felted from air suspension on plane stretches of endless screen conveyers and on rotating cylindrical screens or condensers at relatively stationary deposition areas having an appreciable dimension along the direction of the moving filter. At one boundary of this area the felt is initially begun on the bare filter, and at the opposite boundary the felt receives its last deposited material, the vehicular air passing through a changing thickness of the functioning filter consisting conventionally of the screen and the varying felt as it is formed. As a consequence the formation varies from face to face as a result of growing resistance in the filter from the initial zone to the end zone of formation, assuming of course substantially constant pressure conditions on each side of the functioning filter. This is illustrated by an open suction box underlying a moving screen and by a suspension of fibers at atmospheric pressure exposed to the screen over the suction box. In this illustration the differential pressure through the filter is uniform, but the resistance to air passage varies progressively according to the thickness of the felt locally. This results in a greater volume of air, and hence heavier deposition and closer formation, at the local regions of lower resistance. The present invention aims to overcome variations in felt formation due to the variance in deposition resulting from changing resistance in the felt.

It is a particular object locally to vary at least one of the terminal pressures at the faces of the functioning filter to maintain over substantially all of the deposition area a constant rate of deposition, so that all of the deposition takes place under the same conditions with resulting uniformity of formation from face to face.

It is another object of the invention to vary or control mat formation by locally controlling the various differential pressures to secure various desired formations within the initially deposited felt.

Various other and ancillary objects and advantages of the invention will become apparent from the following description and explanation of the invention as it may be practiced with numerous variations.

In the accompanying drawings:

Fig. 1 is a diagrammatic electrical analog of illustrative felting conditions to facilitate explanation and understanding of the invention.

Fig. 2 is a diagrammatic illustration of a simple felting process by which fibers in suspension at atmospheric pressure settle toward a moving screen in a deposition area over a suction box under the screen, with intervening added resistances.

Fig. 3 is a detailed fragmentary view in vertical



cross section to illustrate variable perforations in cover plates to provide the variable resistances.

Fig. 4 is a view of another form of felter in which fibers are dispersed from superatmospheric pressure as a depositing column over a moving screen under which there is a suction box encompassing the deposition area, said suction box being provided with variable cover resistances.

Fig. 5 is a view showing more generally the character of the felter of Fig. 4.

Fig. 6 is a fragmentary plan view showing one type of resistance cover plates over the suction box of Fig. 4.

In the manufacture of pressed fiber products by compression of air-laid mats in accordance with the above-mentioned conventional prior art methods, variations in the initial mat formation from face to face of the mat are produced which are reflected in different properties at different levels within the compressed product. Especially the face layers of such compressed product may exhibit greatly divergent properties, whereas it is frequently desirable that such pressed products be free from two-sidedness. The present invention is therefore very useful in forming uniform air-laid fiber mats which are later subjected to consolidation, usually in the presence of a binder which permanently integrates the fibers, as for example, into hot-pressed synthetic fiber board exceeding natural wood in density and consisting primarily of felted fibers bonded with thermosetting resin. However, the invention is not at all limited to such field and has application in many fields, such as the manufacture of cotton batting, fiber insulation and packing, insulation board, filtering cloths and papers, air filters, oil filters and the like.

The flow of vehicular air to deposit fibers is caused primarily by the air pressure gradient across the felting system. Hence, varying one or both of the terminal pressures is an effective control of rate of flow, for any fixed resistance. Since the conventional practices employ two regions of fixed terminal pressures at the deposition area, and because the growing mat adds resistance to air flow, the practical control is to control resistance. This is readily done by combining filtering resistance with added resistance.

To explain this practical control, reference is made to an electrical analog in Fig. 1. Numeral **10** is a battery having voltage E. This is comparable to the differential air pressure in felting. A closed circuit **11** to the battery carries current I, predetermined by the circuit resistance R. Resistance R consists of parallel lines **12** to **17** of resistances, six lines being chosen to illustrate a greater number and even an infinite number, each to be compared later with "lines" or "local regions" of the filter of this invention. Each resistance line contains three different resistances in series, designated *a*, *b* and *c*. All the *b*-resistances are equal. The amount of current *i* flowing in each resistance line is predetermined by the resistance $a+b+c$ in its line.

The resistances *a* correspond to the growing resistance of a mat assuming that it begins on a screen at line **12** and is finished at line **17**. The resistances *b* are the constant resistance imposed by the screen. The resistances *c* are such in each line that $a+b+c=$ constant *k*, whereby current *i* is the same in each line.

Transposing this analog to a conventional felting on a screen over a suction box from constant terminal pressures, it is apparent that equal rates of deposition over every local region of the deposition area may be achieved by selection of resistances *c* for equalizing the total resistances locally.

In a continuous felting of a mat on a moving conveyor, every local region of the deposition area corresponds to an exact lengthwise continuous region in the felt in fixed

position between the mat faces. By control of the rate of flow at any local area a select portion of the mat may be controlled as to its formation. Of course, the effect of such control in one area on the superlying portion of the mat must be considered and may call for a series of changes or controls.

The invention, therefore, may be used for a great variety of purposes. For example, and preferably, it may be used to form a mat by a constant rate of deposition of the same fibers throughout all the deposition. Thus, the two face layers and all the inner regions have the same formation. It may be used with disregard of the inner regions, and merely to provide the two face layers with the same formation.

If desired variations along lines crosswise of the moving conveyer may be made, so that, for example, there may be a change in formation from one edge of the formed web to the other.

Because of the possibly complicated effect of a change in one local region upon those ensuing regions which deposit over it, the desired results are best achieved by cut-and-try methods. Where the control is effected by selected added resistance, the cut-and-try method of choosing the resistance is simple and effective, and in practice may call simply for variously perforated plates under the screen. However, it is a means to the broader objective of controlling locally the differential pressure which is effective across the functioning filter, which pressure is the active control over the rate of flow of air, and hence the rate of deposition.

Returning to the electrical analog for an equal overall rate of deposition, it is seen that at the region (line 12) of initial deposition of the fibers on the base screen, the resistance *a*–12 is zero, and the resistance *c*–12 must at least equal the resistance *a*–17 of the finally formed mat at line 17. Where there is a resistance *c* at the last line of deposition (electrical line 17) the resistance *c*–12 must be substantially equal to mat-resistance *a*–17 plus added resistance *c*–17.

Fig. 2 shows a large gravity deposition chamber into which fibers are introduced for gravity fall through air at atmospheric pressure. It has a chamber 20 open to atmospheric pressure with front wall 21, rear wall 22 and side walls 23. The chamber is positioned over the upper stretch of an endless wire screen 25 passing over rollers, such as end roll 26, on which screen the felt F is to be formed. High in the chamber there is a horizontal sifting rack or screen 28 suitably open, so that in rapid horizontal reciprocation it sifts fibers 29 from its loose load 30. An eccentric drive 31 is connected by rods 32 to the rack 28 to provide the sifting reciprocation. Arrows 33 variously dispersed above the rack 18 illustrate suitable means (not shown) to maintain an equalized supply of fiber for load 30 on the rack.

Below the chamber 20 and encompassing a deposition area which is the bottom of said chamber 20, is a suction box 34 connected by conduit 35 to a suction device such as the intake of a blower 36 operated to maintain a substantially constant subatmospheric pressure in the suction box 34.

The top of the suction box adjacent the screen 25 is provided with a cover. As shown, the cover consists of numerous individual plates 37 easily removable and interchangeable. These plates 37 are strips running crosswise of the moving conveyor. The plates 37 are so mounted that they provide a plane or platform support for the screen 25 and they may be variously pervious, or in some cases impervious, to the passage of air into suction box 34. The felt F as it is being formed as shown within the deposition area has an inclined plane as its forming top, resulting from a uniform accumulation of fibers as the screen advances at a fixed rate through a uniform shower of fibers 29. For convenience the cover plate 37 at the beginning edge of the felt is designated $37^a$ and that at the finishing edge of the felt is designated $37^b$.



The plate $37^a$ is but slightly perforated to provide resistance to air flow, the resistance being uniform crosswise of the conveyer. There are also perforations in plate $37^b$, which is more open than plate $37^a$ to offer less resistance to air flow. During felt formation as illustrated, the total resistance at every given area is the same and consists of the resistance of the cover plate at that area, the resistance of the screen 25 and the resistance of the formed felt over the area. The plates 37 between the terminal plates $37^a$ and $37^b$ are therefore open or perforated and the resistance is properly graduated downwardly from plate $37^a$ to plate $37^b$, so that the growing top 38 of the felt is an inclined plane.

Fig. 3 is merely exemplary of graduated resistance, without signifying that the illustrated proportions are exact for the incline plane described. The plates 37 are shown as together providing a platform for screen 25. The open space in the mesh on the underside of screen 25 is sufficient to distribute the suction generally about each opening. This distribution and the general advance of the screen minimize the effect of distance between perforations.

By reason of the rack 28 being so constructed and operated as to supply a substantially uniform concentration of falling fibers over the area and by reason of the added resistances at the suction box, the formation of the felt is the same from beginning to end and hence from face to face, because the fibers deposit on all areas with the same rates, with the same randomness of orientation and with the same impact.

The invention is likewise applicable to felting operations in which the gas in which the fibers are suspended is at superatmospheric pressure or is variable over the deposition area from atmospheric pressure to superatmospheric pressure. Such an apparatus is illustrated in Figs. 4 and 5. The numeral 40 designates a semi-cylindrical dispersing head at the bottom end of a vertical column comprising a box-like section 41 just above the head 40, and an upwardly tapering extension 42 functioning as an expansion conduit or chamber. The top of the chamber 42 is connected to a conduit elbow 43 which leads downwardly at an incline by way of a straight and long conduit 44 to the discharge side of a blower 45. The intake side of the blower 45 is designated 46 and draws air from the atmosphere at a hopper-like opening 47. Into the opening 47 a supply of fiber 48 is fed at a constant rate by means not shown.

In the dispersing head 40 there is a coaxial rotary agitator designated 50 operating at high speed to maintain a supply of fibers in the head well dispersed and in agitation. A squirrel-cage type of rotor is suitable with its bars 51 provided with bristles 52, to sweep fibers through openings in the head 40. The lower arcuate portion 55 of the head 40 is perforated, for example over an arc of about 100°, with fiber-dispersing holes 56 arranged uniformly lengthwise along geometrical elements of the cylindrical head, but not necessarily uniformly in adjacent elements. In operation the fibers in the head 40 are at superatmospheric pressure and by means of the rotor 50 they are evenly dispersed and discharged along said elements and through the perforations 56, forming a column of fiber suspension moving downwardly toward a suitable filtering conveyer to form a felt thereon.

A moving endless wire screen has its upper stretch 60 move under said head 40 from end roll 61. Beneath the upper stretch 60 of the screen there is a suction box 63 connected by conduit 64 to the suction side of a blower 65 discharging against atmospheric pressure. The suction box 63 is preferably made to encompass an area somewhat greater than the projected area of the head 40 on the screen which makes possible the planned variations in product properties because of the variable controls. The top of the suction box is provided with resistance plates 67 in the general manner previously described with reference to Figs. 2 and 3.

There may be provided a vertical baffle **68** extending downwardly between side walls **69** from the semi-cylindrical head **40** substantially to the wire screen **60** in order to define a clear-cut boundary line for the beginning of felt formation. In furtherance of this objective, the cover plates or plate **67** over that portion of the suction box to the rear of the baffle **68** may be impervious to render suction non-effective. This cover portion **67** may be perforated to a minor degree if it is desired to catch by suction such fibers as may bleed out of space **70** between the bottom edge of the baffle **68** and the screen **60**. The plates **67** in the direction of felt formation are variously perforated in accordance with the kind of formation desired. Whereas Fig. 2 illustrates formation of the felt by uniform deposition over the whole area, the plates of Fig. 4 for the purpose of illustrating a modification, are so perforated that different rates of deposition, and hence different types of formation, may be effected. The forming face of the felt is illustrated by a contour line having end portion **72**, a middle portion **73** and final portion **74**. The cover plates **67** on the suction box are, therefore, perforated to control the rates of depositions differently in these three zones. If desired, the lines **72** and **74** may represent the same conditions so that the facial formations of the resulting felt **76** are the same, and the central portion of the felt, corresponding to forming line **73**, may be different in character, as the result of a greater rate of deposition indicated by the greater slope of line **73**.

Fig. 6 is a plan view of a suction box cover to exemplify the range of possibilities. The dotted line **80** indicates the direction of felt formation over the cover comprising crosswise perforated plates **81** through **87**. On each side of line **80** the resistance decreases in the direction of felt formation. Not only the spacing, but the size of the holes varies. With respect to the conditions described for Fig. 2, the length of each plate is uniformly perforated. However, this need not be so in all cases. The plates **81**—**87** are each of different resistance values on the two sides of line **80**, thus to form a felt having two different but integrated felts.

From the foregoing it will be understood that the invention provides special controlling means for use in felting fibers on a continuously moving filter from a carrying gaseous vehicle. Not only may the said means be formed to produce felts which have uniform formation from face to face, but it may be used to create a variety of special felts, all as contemplated by the invention as expressed in the appended claims.

I claim:

1. The method of felting which comprises continuously and relatively moving a filtering conveyer through a relatively fixed deposition area, continuously maintaining in said area on one side of said conveyer a gaseous suspension of feltable fibers at a substantially constant gas pressure, maintaining directly at the other side of said conveyer in said area locally different and lower gas pressures, whereby the differential pressures over said area result in depositing a growing felted mat on said conveyer in said area, and fixing the said local pressures for uniformity along lines crosswise of the conveyer in accordance with the speed of the conveyer and growth of the mat to maintain between the faces of the mat predetermined local differential pressures, whereby to control the deposition locally in said area and thereby control the structure of the deposited mat.

2. The method of felting which comprises continuously and relatively moving a filtering conveyer through a relatively fixed deposition area, continuously maintaining in said area on one side of said conveyer a gaseous suspension of feltable fibers at a substantially constant gas pressure, maintaining directly at the other side of said conveyer in said area locally different and lower gas pressures, whereby the differential pressures over said area result in depositing a growing felted mat on said conveyer in said area, and fixing the said local pressures for uniformity along lines crosswise of the conveyer and for differences lengthwise of the conveyer in accordance with the speed of the conveyer and growth of the mat to maintain between the faces of the mat predetermined local differential pressures, whereby to control and to render uniform the deposition along each of said lines and thereby to vary and control the structure of the deposited mat from face to face.

3. The method of felting which comprises continuously and relatively moving a filtering conveyer through a relatively fixed deposition area, continuously maintaining in said area on one side of said conveyer a gaseous suspension of feltable fibers at a substantially constant gas pressure, maintaining directly at the other side of said conveyer in said area locally different and lower gas pressures, whereby the differential pressures over said area result in depositing a growing felted mat on said conveyer in said area, and fixing the said local pressures for uniformity along lines crosswise of the conveyer and for graded differences lengthwise of the conveyer in accordance with the speed of the conveyer and growth of the mat to maintain between the faces of the mat predetermined local differential pressures, whereby to control and to render uniform the deposition along each of said lines and to vary progressively and to control the structure of the deposited mat from face to face.

4. The method of felting which comprises continuously and relatively moving a filtering conveyer through a relatively fixed deposition area, continuously maintaining in said area on one side of said conveyer a gaseous suspension of feltable fibers at a substantially constant gas pressure, maintaining directly at the other side of said conveyer in said area locally different and lower gas pressures, whereby the differential pressures over said area results in depositing a growing felted mat on said conveyer in said area, and fixing the said local pressures for uniformity along lines crosswise of the conveyer and for difference in the end zones of the length of said area along the conveyer in accordance with the speed of the conveyer and growth of the mat to maintain between the faces of the mat predetermined local differential pressures, whereby to control and to render uniform the deposition along each of said lines and thereby to vary the deposition and to control the structure of the facewise layers of the deposited mat.

5. The method of felting which comprises continuously and relatively moving a filtering conveyer through a relatively fixed deposition area, continuously maintaining in said area on one side of said conveyer a gaseous suspension of feltable fibers at a substantially constant gas pressure, maintaining directly at the other side of said conveyer in said area locally different and lower gas pressures, whereby the differential pressures over said area result in depositing a growing felted mat on said conveyer in said area, and fixing the said local pressures in accordance with the speed of the conveyer and growth of the mat to maintain equally over said area a substantially uniform rate of deposition.

6. The method of felting which comprises continuously and relatively moving a filtering conveyer through a relatively fixed deposition area, continuously maintaining locally in said area on one side of said conveyer gaseous suspensions of feltable fibers each at substantially constant conditions of fiber character, fiber concentration and gas pressure, maintaining directly at the other side of said conveyer in said area locally different and lower gas pressures, whereby the differential pressures over said area result in depositing a growing felted mat on said conveyer in said area, and fixing the said lower local pressures in accordance with the speed of the conveyer and growth of the mat to maintain locally over said area substantially the same rate of deposition.

7. The method of felting which comprises continuously and relatively moving a filtering conveyer through a rela-

tively fixed deposition area, continuously maintaining locally in said area on one side of said conveyer gaseous suspensions of feltable fibers each at substantially constant conditions of fiber character, fiber concentration and gas pressure, maintaining directly at the other side of said conveyer in said area locally different and lower gas pressures, whereby the differential pressures over said area result in depositing a growing felted mat on said conveyer in said area, and relatively fixing the cooperating local pressures on said two sides of the conveyer in accordance with the speed of the conveyer and growth of the mat to maintain locally over said area substantially the same rate of deposition.

8. The method of felting which comprises continuously and relatively moving a filtering conveyer through a relatively fixed deposition area, continuously maintaining locally in said area on one side of said conveyer and along lines crosswise of the conveyer gaseous suspensions of feltable fibers each at substantially constant conditions of fiber character, fiber concentration and gas pressure, maintaining directly at the other side of said conveyer in said area locally different and lower gas pressures uniformly crosswise of the conveyer, whereby the differential pressures over said area result in depositing a growing felted mat on said conveyer in said area, and fixing the said local lower pressures in accordance with the speed of the conveyer and growth of the mat to maintain along each line crosswise of the conveyer substantially the same rate of deposition.

9. The method of felting which comprises continuously and relatively moving a filtering conveyer through a relatively fixed deposition area, continuously maintaining locally in said area on one side of said conveyer and along lines crosswise of the conveyer gaseous suspensions of feltable fibers each at substantially constant conditions of fiber character, fiber concentration and gas pressure, maintaining directly at the other side of said conveyer in said area locally different and lower gas pressures, whereby the differential pressures over said area result in depositing a growing felted mat on said conveyer in said area, and fixing the said local lower pressures in accordance with the speed of the conveyer and growth of the mat to maintain locally over said area substantially the same rate of deposition.

10. The method of felting which comprises continuously and relatively moving a filtering conveyer through a relatively fixed deposition zone, continuously maintaining in said zone over one side of said conveyer gaseous streams of suspended fiber to be deposited thereon, the two end regions of said zone extending crosswise of the conveyer and bounding said zone lengthwise of the conveyer having fiber suspensions each at substantially constant conditions of fiber character, fiber concentration and gas pressure, maintaining directly at the other side of said conveyer opposite said zone locally different and lower gas pressures, whereby the differential pressures within the area defined by said zone result in depositing a growing felted mat on said conveyer in said zone, and fixing the said local lower pressures below said two suspensions at said end regions in accordance with the speed of the conveyer and growth of the mat to maintain the same rate of deposition of the first and last deposited portions of the mat.

11. The method of felting which comprises continuously and relatively moving a filtering conveyer through a relatively fixed deposition area, continuously maintaining in said area on one side of said conveyer a gaseous suspension of feltable fibers at a substantially constant gas pressure, maintaining on the other side of said conveyer in said area a substantially constant and lower gas pressure, whereby the differential pressure over said area results in depositing a growing felted mat on said conveyer in said area, and imposing resistances to air flow at local regions between said conveyer and said lower pressure region, the value of said resistances being predetermined in accordance with the speed of the conveyer and growth of the mat to maintain equally over said area a substantially uniform rate of deposition.



12. The method of felting which comprises continuously and relatively moving a filtering conveyer through a relatively fixed deposition area, continuously maintaining in said area on one side of said conveyer a gaseous suspension of feltable fibers at a substantially constant gas pressure, maintaining on the other side of said conveyer in said area a substantially constant and lower gas pressure, whereby the differential pressure over said area results in depositing a growing felted mat on said conveyer in said area, and imposing resistances to air flow at local regions along lines crosswise of the conveyer between said conveyer and said lower pressure region, the value of said resistances being predetermined in accordance with the speed of the conveyer and growth of the mat to maintain along said lines a substantially uniform rate of deposition.

13. The method of felting which comprises continuously and relatively moving a filtering conveyer through a relatively fixed deposition area, continuously maintaining said area on one side of said conveyer a gaseous suspension of feltable fibers at a substantially constant gas pressure, maintaining on the other side of said conveyer in said area a substantially constant and lower gas pressure, whereby the differential pressure over said area results in depositing a growing felted mat on said conveyer in said area, and imposing resistance to air flow at local regions between said conveyer and said lower pressure region including the conveyer-end-regions of said area, the value of the resistances at said end-regions being predetermined in accordance with the speed of the conveyer and growth of the mat to maintain in said end-regions substantially the same rate of deposition, whereby to render uniform the first and last deposited layers.

14. The method of felting which comprises continuously and relatively moving a filtering conveyer through a relatively fixed deposition area, continuously maintaining in said area on one side of said conveyer a gaseous suspension of feltable fibers at a substantially constant gas pressure on each local region over said deposition area, maintaining on the other side of said conveyer in said area a substantially constant and lower gas pressure, whereby the differential pressure over said deposition area results in depositing a growing felted mat on said conveyer in said area, and imposing selected resistance to air flow at local regions between said conveyer and said lower pressure region whereby to control the rate of flow of air at each local region of the deposition area by the sum of the resistance of the growing mat at said local region, the resistance of the conveyer and the imposed selected resistance.

15. Felting apparatus comprising in combination a movable filtering conveyer on which continuously to form an air-laid felt by differential air pressure therethrough, means providing a continuous supply of feltable fibers in air suspension exposed to said conveyer at uniform conditions of concentration and air pressure at all local regions of said supply over a deposition area on said conveyer, a suction box below said conveyer encompassing said deposition area and positioned to draw air through said conveyer from said fiber suspension, means to maintain a substantially constant subatmosphere pressure in said suction box, and air-passing cover means between said suction box and said conveyer, said cover means having a locally predetermined resistance to air flow, each said local resistance being uniform across the direction of motion of the conveyer, and the local resistances varying in said direction, whereby at each local area the total resistance between the terminal pressures consists of the resistance in said cover means, in said conveyer, and in the growing felt being formed thereon.

16. Felting apparatus comprising in combination a

movable filtering conveyer on which continuously to form an air-laid felt by differential air pressure therethrough, means providing a continuous supply of feltable fibers in air suspension exposed to said conveyer at uniform conditions of concentration and air pressure at all local regions of said supply over a deposition area on said conveyer, a suction box below said conveyer encompassing said deposition area and positioned to draw air through said conveyer from said fiber suspension, means to maintain a substantially constant subatmospheric pressure in said suction box, and removable cover plates for said box interposed between the area of suction and said conveyer, said plates being perforated variously to provide various reistances locally to air flow between the terminal pressures, whereby to control locally the flow of air and fiber in forming felt on said screen.

17. Apparatus for felting comprising a continuously movable filtering conveyer on which to form a fiber felt by filtration from a gaseous suspension of fibers, means providing substantially constant but different terminal gas pressures on both sides of said conveyer at a deposition area of said conveyer whereby the differential pressure causes flow of gas through said conveyer, means to maintain in the gaseous region at the higher pressure a substantially constant supply of fibers in suspension at each local region, whereby the said flow of air causes continuous deposition of fibers on said conveyer as the conveyer moves continuously, and air-passing means providing locally in said deposition area between said conveyer and said lower pressure gaseous region predetermined resistance to air flow between said terminal pressures, each said local resistance being uniform across the direction of motion of the conveyer, and the local resistances varying in said direction, whereby said local resistances may be selected and predetermined in relation to the resistance offered by the growing felt.

18. Apparatus comprising means forming a continuously movable filtering conveyer on which to form a fiber felt from a gaseous suspension of fiber moving toward a deposition zone at a first face of the conveyer, a suction box opening toward the second face of said conveyer and defining said deposition zone, means to create and continuously maintain a fixed pressure in said box, means continuously to provide a gaseous suspension of fiber at a pressure above that in said box, said suspension being exposed to said first face for deposition of fibers thereon, and fixed means between said suction box and said second face for the passage of air from said suspension into said box, said fixed means offering resistance to the flow of air therethrough, said resistance varying locally in the direction of movement of the conveyer and being constant along lines crosswise of said direction.

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