Aug. 23, 1960 J. D'A. CLARK 2,949,646

METHOD FOR FORMING FIBROUS STRUCTURES

Filed Nov. 24, 1953 3 Sheets-Sheet 1

Fig. 1

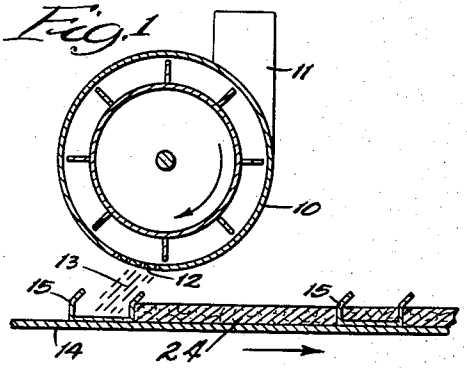


Fig. 1A

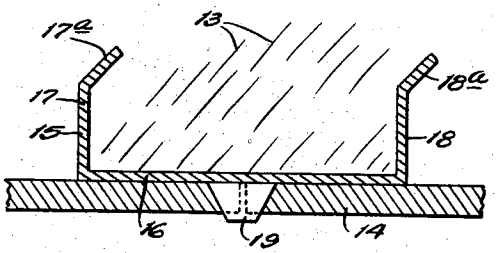


Fig. 2

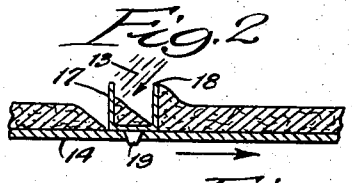


Fig. 3

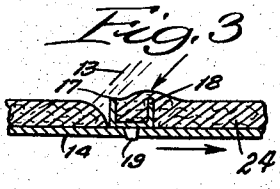


Fig. 4

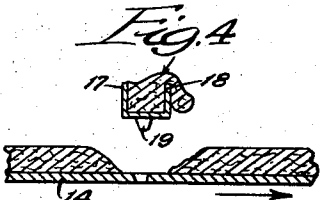


Fig. 5

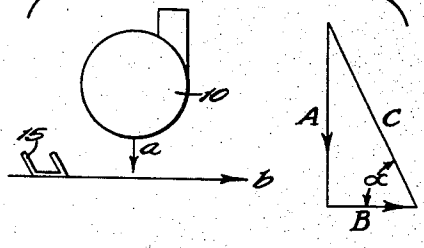


Fig. 6

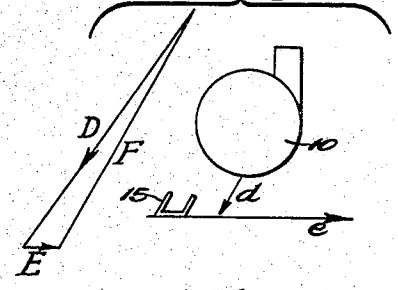


Fig. 7

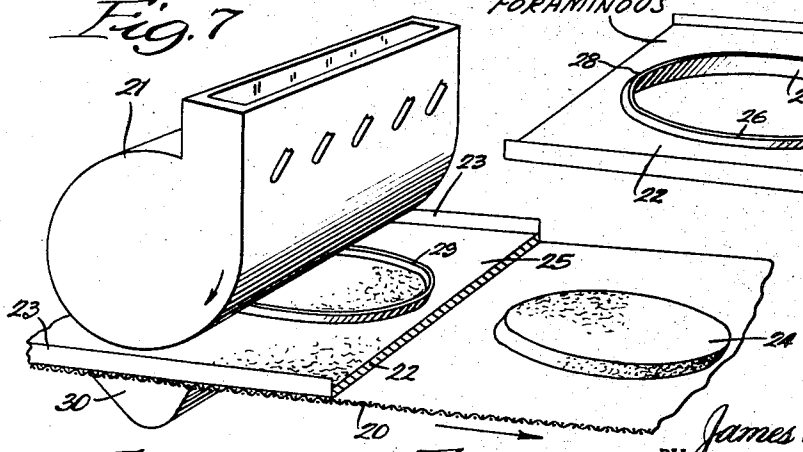


Fig. 8

Fig. 8A

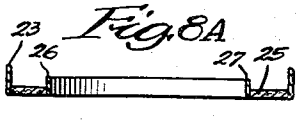
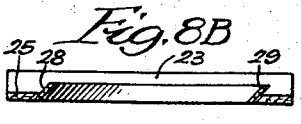


Fig. 8B

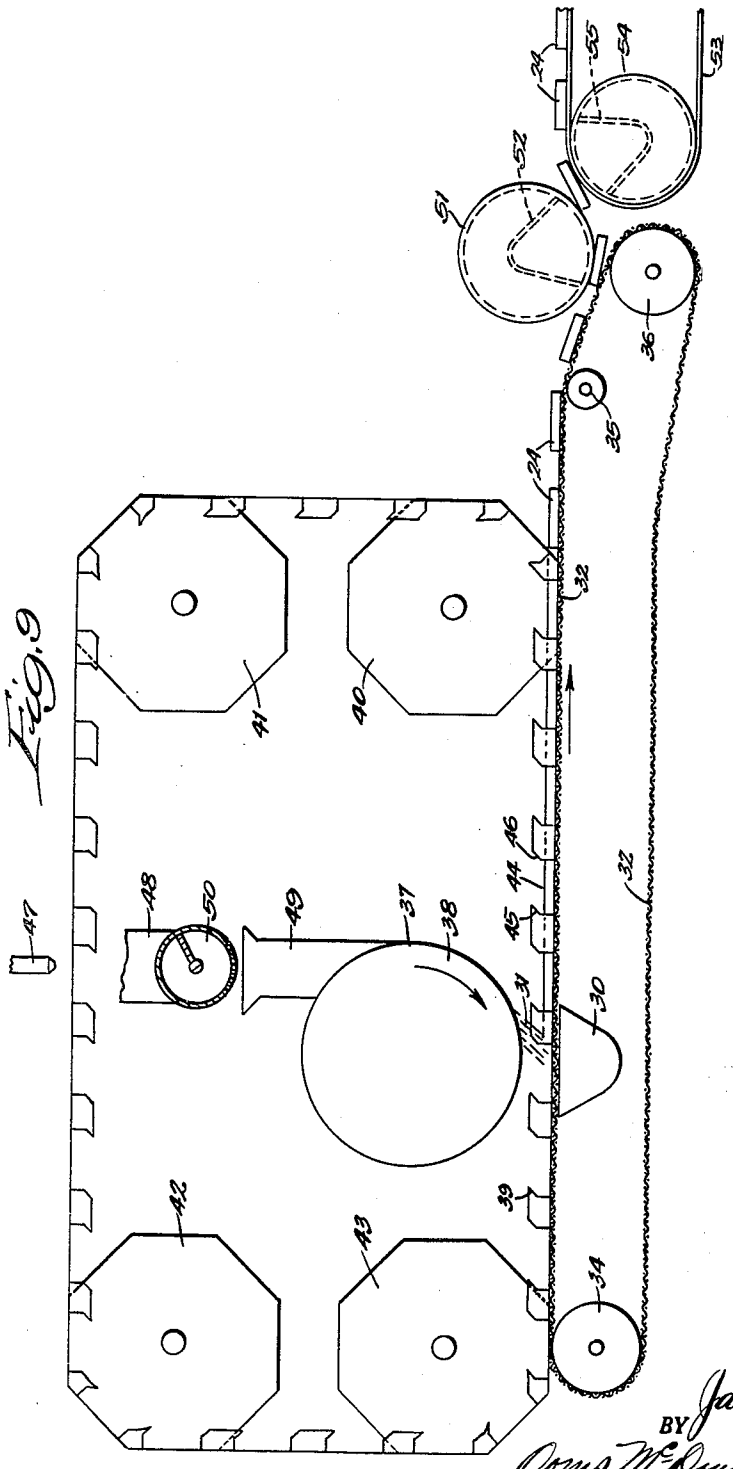


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METHOD FOR FORMING FIBROUS STRUCTURES

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METHOD FOR FORMING FIBROUS STRUCTURES

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Fig. 10

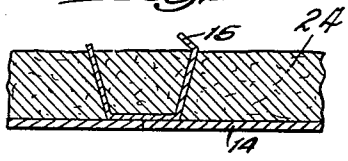


Fig. 11

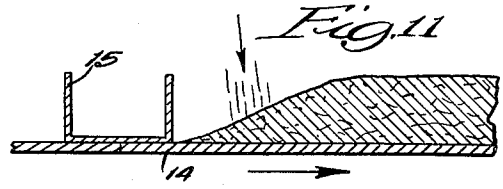


Fig. 12

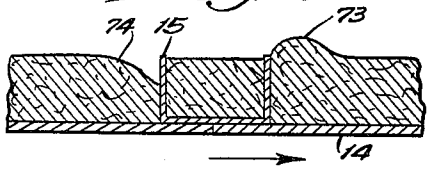


Fig. 13

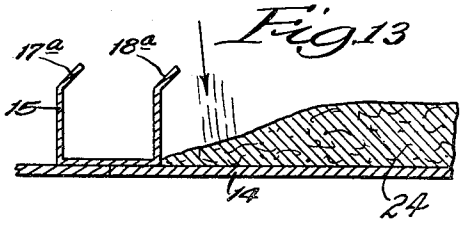
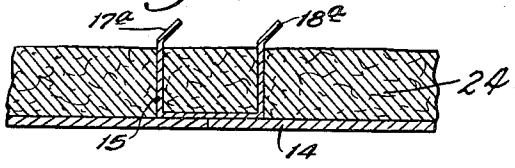


Fig. 14



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METHOD FOR FORMING FIBROUS STRUCTURES

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Filed Nov. 24, 1953, Ser. No. 394,022

6 Claims. (Cl. 19—155)

This invention relates to the preparation of fibrous structures for processing in a system wherein individual fibers or fibrous elements are deposited in continuous fashion upon a collecting wall moving in one direction, and relates more particularly to a method and apparatus for achieving the separation of fibrous structures in a system of the type described for subsequent molding into individual pieces.

As used herein, the term "fibers" is intended to include dry or damp fibrous elements such as cotton fibers, individual wood tracheids, Asplund fibers, cross cut fibers, wafers and the like, which may be deposited to form structures, such as an endless web, as by the method and apparatus described and claimed in my copending applications, Serial No. 61,674, filed on November 23, 1948, entitled "Apparatus and Method for Producing Fibrous Structures," Serial No. 286,716, filed on May 8, 1952, now U.S. Patent No. 2,748,429, similarly entitled, and Serial No. 313,316, filed on October 6, 1952, now U.S. Patent No. 2,720,005, entitled "Air Scrabbler System for Fiber Deposition in the Manufacture of Fibrous Structures," or other dry fiber depositing systems.

Various means have been devised for the separation or delineation of the shape of structures of continuously deposited fibers, but, to the present, none of such means have been efficient in operation or, in particular, have they been satisfactory with respect to the characteristics of the leading and trailing edges of the fibrous structures so formed. The deposition of individual uniformly thick structures of various odd shapes, such as circular disks, annular rings, hollow squares and the like, from fibers entrained in a stream of air, has been especially difficult.

In one type of system the fibers are deposited continuously from an air stream in which they are entrained, onto the surface of a continuously moving foraminous belt which has suction applied to its underside, and which carries an imperforate mask over those areas not defining the wanted shape, so as to cause the fiber laden air to be directed towards the desired foraminous area. It is clear that such a system must give a non-uniform thickness of deposit over the desired areas since fibers initially directed towards the masked areas are deflected to the unmasked areas and there tend to be deposited adjacent the perimeters thereof.

Accordingly, in order to overcome the above discussed drawbacks to the efficient fabrication of shaped fibrous structures of uniform thickness such as filter disks and the like, it has hitherto been customary to deposit the fibers into a continuous web of uniform thickness and then cut the web into the desired shapes. This is undesirable because of the need for the added operation of cutting, wasting material in the trimmings, and the shortened fibers left in the cut edges, which thereafter easily dust out.

In operations where the fibrous elements can be deposited to form a structure without air, by gravity, a practice has been hitherto to limit the shape of the deposited structure by filling the elements into successive pans to the

height desired by an intermittent operation. In another system commonly used hitherto where a continuous web or mat of the elements is formed either by gravity or by deposition from a stream of air, the fibers are deposited upon the surface of a series of caul plates which may be either imperforate or foraminous, the cauls being positioned in end-to-end relation for travel at a uniform rate through a fiber-depositing zone. After the fibers have been deposited to form a continuous layer of desired thickness, the cauls are separated to divide the web into sections corresponding to the length of the cauls for feeding the separated sections together with the separated cauls into the openings of a press for consolidating into panels, boards, or the like, under heat and pressure.

Because of the lengths of the fibers and because of their interfelting arrangement in zigzag fashion throughout the deposited fibrous layer, it has been difficult to achieve a clean break or separation of the web into well defined mats upon the cauls. As a result, the ends of the mats become ragged, with some clusters of fibers overhanging the edge while others are extracted from the edge, with a result that the ends of the mats, especially if the fibers are short and stiff, usually collapse and after molding, the fiber density in the end sections becomes non-uniform and an inferior product is secured unless a substantial length of the end pieces of the molded product are removed and discarded subsequent to molding. This not only constitutes a waste of material, but the additional length of the structure must be accommodated in the molding and subsequent operations.

These are but a few of the difficulties arising in the process of depositing fibrous elements from a fluidized system to produce separated fibrous structures and, to overcome these, it is an object of this invention to provide a simple and expedient method to produce separated structures of fibers which are being continuously deposited on a moving collecting surface.

Another object is to provide a method and apparatus for making individual mats of pre-selected shape from fibrous material continuously deposited upon a moving surface and with minimum waste.

A further object is to provide a method and apparatus of the type described for use in the production of separated fibrous structures with minimum differential in the lengths or density of fibers at the edges, which permits the formation of fibrous structures of predetermined contour at the edges, which permits the deposition of fibers to form fibrous structures having a length in which cut-off subsequent to molding can be eliminated and a product of uniform density and quality secured without waste of fibrous material and without molding to extra lengths, which is free of any effect on the fibers so as to permit reuse of any and all fibers which are removed from the fibrous structure prior to molding, and which substantially completely eliminates the danger of free fibers falling from the edges to give an irregular contour and to fall on the carrying member and interfere with subsequent operations.

These and other objects and advantages of this invention will hereinafter appear and for purposes of illustration, but not of limitation, embodiments of the invention are shown in the accompanying drawings, in which—

Figure 1 is a schematic sectional elevational view illustrating means embodying features of this invention for the production of separated fibrous structures;

Figure 1A is an enlarged view of a portion of Figure 1;

Figures 2, 3 and 4 are enlarged sectional elevational views of separating devices illustrating the defects which result in the distribution of fibers deposited when features embodying the concepts of this invention are absent therefrom;

Figures 5 and 6 are vector diagrams illustrating the applications of the inventive concepts to various conditions;

Figure 7 is a perspective view of a fiber depositing system illustrating a modification in a means for producing separated contoured structures;

Figure 8 is a perspective elevational view of a screening member raised from Figure 7; and Figures 8A and 8B are sectional elevational views of a mask used in the preparation of a fibrous structure as illustrated in Figure 7;

Figure 9 is a schematic elevational view of a fiber depositing system for the manufacture of separated fibrous structures in a continuous fashion;

Figure 10 shows a modified shape of separator to that shown in Figure 1A;

Figures 11 and 12 are sectional elevational views of a separating device illustrating defects that result in the distribution of large particles which can slide over each other, deposited by gravity and without vacuum holding them down, when features embodying concepts of this invention are absent; and

Figures 13 and 14 illustrate a modification of the separator in Figures 10 and 11 embodying features of this invention.

By way of example, description herein will be made in connection with a fiber depositing head comprising a cylindrical housing **10** having an inlet **11** at one end into which separated fibers or fibrous elements are fed into the housing. The bottom wall of the housing is provided with a slot or a foraminous section, hereinafter referred to as a separating wall **12**, through which fibers **13** are carried through the separating wall for deposition to form fibrous structures on a collecting wall **14**. Means such as a mechanical scrabbler, as described in my copending application Serial No. 61,674, or Serial No. 286,716, or if the collecting wall is foraminous, an air scrabbler such as described in my copending application Serial No. 313,316, cause the fibers to become entrained in an air stream for rotation rapidly about the housing under positive pressure so that at each revolution a quota of the fibers will be carried with the air in substantially equal or uniform volumes through each of the openings of the separating wall, and deposited upon a collecting wall, usually in the form of a continuous screen.

Fibrous elements passing through the slots or foramens of the separating wall deposit in interfelted relation to form a layer on a collecting wall which, if a mechanical scrabbler is used without air, may be in the form of imperforate metal caul plates or collecting members **14** laid end-to-end to form a continuous surface; if air is used, then an endless woven screen carrying individual screens or a conveyor carrying individual foraminous caul plates are suitable. Since the fibrous elements pass through the foraminous separating wall in substantially equal volumes and in continuous fashion and in uniform distribution, it is expedient to advance the collecting wall or caul plates in one direction to form an endless web or mat on the surfaces thereof. The thickness of the layer of fibers deposited depends on the rate of fiber deposition and the linear speed of the collecting members as they pass through the fiber depositing zone.

In order to effect a clean separation of the deposited fibers into individual mats centrally located upon each collecting member **14** without destruction of the fiber lengths or without non-uniformity in the concentration of fibers at the end sections, an elongated trough **15** shown in Figure 1A having a flat bottom wall **16** and vertically-disposed side walls **17** and **18** extending upwardly from the edges thereof, is positioned directly over the parting line between the individual collecting members **14**. The trough is dimensioned to extend laterally across the collecting member and the bottom wall is dimensioned to have a width to extend about an inch or more over the adjacent ends of the individual collecting members. Various means may be employed for locating the trough members in position of use. One such means, as illustrated, comprises pins **19**, preferably conically shaped for ease of location, extending downwardly from the end portions of the bottom wall for entrance into appropriate openings provided in the abutting edges of the collecting members. The depending pins and openings are preferably conically shaped for simplification of locating the trough in position of use and for holding the trough firmly when properly located in that position.

When in position of use, the trough **15** functions to collect the fibrous elements which have been deposited on the covered area between the collecting members. Because of the relative movement of the members and trough in one direction, and because of the direction in which the fibers are deposited, it has been found that the fibers do not deposit in uniform concentration in the areas within and adjacent the troughs when the walls thereof extend perpendicularly throughout their length. As illustrated in Figure 2 or 3 of the drawings, when the collecting members travel in a direction to the right through a fiber depositing zone wherein the fibers are being thrown in the direction to the left in Figure 1, as by scrabbler means causing circulation within the housing in a clockwise direction, a mound of fibers will tend to build up in the area immediately in advance of the leading wall **18** of the trough, while the end portion adjacent the trailing wall **17** is deficient in the amounts of fiber deposited and forms a depressed portion having lesser thickness or concentration. Obviously, these conditions would lead to non-uniformity with respect to density of the molded product and many of the undesirable conditions of the previously discussed prior art, which conditions this invention was intended to overcome.

It will be clear that if the side walls of the trough are made to extend only to the level of the mat of deposited elements as in Figure 3, the non-uniformity of the deposit adjacent the trough will be less than when the sides of the trough extend above the mat as in Figure 2. However, if the fibers are flexible enough to be able to drape themselves over the rim of the trough, or if they are well felted or cohere together during their deposition, then, as shown in Figure 4, when the trough is lifted up, elongated masses of fibers will be lifted along both sides of the trough and leave both ends of the deposited mats deficient in fibers. Furthermore, before the masses of fibers are removed from the elevated trough, there is likelihood that portions of them will break away and fall somewhere on the surface of the deposited mat and when consolidated therein, cause serious defects.

It has been found that these variations in the concentration of fibers deposited immediately in advance of and to the rear of the trough may be substantially completely eliminated and fiber layers of uniform thickness deposited when the vertically-disposed walls of the trough are formed to extend angularly in a longitudinal direction depending upon the direction and speed of movement of the collecting wall through the fiber depositing zone and the angular direction and speed of movement of fibers issuing from the fiber depositing head.

In practice, it is best to position the fore and aft portions of the walls extending upwardly, hereinafter referred to as the "deflector plates," to engage the fibers at an angle which, as shown in Figures 5 and 6, constitutes the resultant of the angular velocity of the fibrous elements and the linear velocity of the collecting surface as the vectors. For example, when fibrous elements such as wooden fibrous elements of substantial dimension, are deposited from a felting head which relies more upon gravitational flow than upon flow in which gravity is minimized by reason of entrainment in air streams, the angular velocity of the elements can be represented by a vector A and the linear velocity of the belt or caul plate upon which the fibrous elements are deposited can be represented by the vector B. The resultant, C identifies the preferred angle between A and B for the de-

flector plates and the collecting wall, but it will be understood that the angle can vary by plus or minus 15 degrees especially in order to collect slightly more or less fibrous elements along the adjacent edges if such can be tolerated or if desired. If the fibrous elements are relatively large and smooth, as wooden wafers and/or of such a nature that they can bounce and slide when deposited, anomalous condition results which will be referred to later in this disclosure.

On the other hand, in an air-borne fiber depositing head illustrated by Figures 7 to 9, the angular velocity of the fibers issuing from the fiber depositing head can be represented by the vector D and the linear velocity of the collecting surface can be represented by the vector E. The resultant F defines the angle for the deflector plates and the collecting wall in order to achieve uniform concentrations of fibers throughout the lengths of the fibrous structure.

It will be apparent that in the gravity system illustrated in Figure 5 wherein air is not used in the fiber depositing head to entrain the fibrous elements, the elements may travel in the direction of travel of the collecting surface, as illustrated, and the deflector plates will be positioned to extend at an angle rearward from the direction of travel, whereas in the air scrabbler system, wherein the air and fibers issue from the fiber depositing head at high velocity, the linear travel of the deflecting surface will have minor influence and the angular position of the deflector plates will be more in the direction of the angle of emission and, as illustrated in Figure 6, in the direction of travel.

When it is desired to produce vertical edges of the formed layers of deposited fibers, as illustrated in Figure 1, the sides of the walls may extend upwards for a height corresponding to the thickness of the layer of fibrous elements deposited, while the remainder **17a** and **18a**, forming the deflector portion, extends substantially in parallel relation as determined by the considerations of Figures 5 and 6.

The separating troughs need not be parallel nor limited with respect to length or shape. As shown in Figure 7, the separating members may be contoured in a manner to mask or cover a selected area upon the collecting wall **20**, between or along the area of fiber deposition from head **21**, with a mask **22** which may have sides or deckles **23**, the mask being shown lifted in Figure 8. When the mask has been carried on collecting wall **20** beyond the felting zone beneath head **21**, it is separated from the wall leaving the desired shape of structure **24** left upon the wall. The surrounding fibrous structure **25** is lifted with the mask from which it is subsequently removed for reuse before the mask is repositioned on the collecting wall to pass under the head **21** again.

It is preferred to make the side walls **26** and **27** of the mask that are parallel to the direction of movement of the collecting wall, vertical, as shown in Figure 8A, while at least the upper portion of the fore and aft walls **28** and **29** are sloped forwards in accordance with the requirements previously herein discussed. In practice, the minimum thickness of the section (corresponding to the height of the walls) should correspond to the thickness of the uncompressed deposited mat of fibers plus the length of the longest of the fibers deposited. This avoids the possibility of having some of the fibers extend beyond the upper edge of the walls of the mask whereby a disturbance can be created when the mask is lifted. As illustrated in Figures 7 and 8, the walls **28** and **29** are deposited at an angle, as previously described, to compensate for the direction of the movement of the conveyor **20** and the direction of flow of the fibers through the fiber-depositing zone. The side walls of the masking member may be formed vertically since they are not affected by the linear movement or by the directional flow of the fibers.

If the fibers are deposited from a stream of air as in the form of jets, the base of the mask outside the desired shape of structure is made of foraminous material so as to provide for a uniform flow of air through the collecting wall across the width of the depositing head. If made imperforate, the fibers directed towards this area from the head will be deflected towards the unmasked area by the vacuum applied thereunder by suction box **30** and cause the zone around its edges to build up to an excessive thickness.

By the means disclosed, it is possible to deposit uniformly thick mats of fibers, the mats having any desired shape, in a simple and expedient manner and without waste of fiber. The sequence of operations may be conveniently mechanized so as to be automatic as will now be described.

As illustrated in Figure 9, when depositing fibers from an air stream the concepts of this invention may be embodied in a continuous means for depositing fibrous elements **31** to form separated fibrous structures of de sired shape, in this case circular areas **24**, on the surface of a collecting wall in the form of an endless screen **32** operating about idler rollers **33**, **34** and **35** and driven by roller **36**. In this modification, the fibers are deposited onto the surface of the separating wall from a fiber depositing head **37** of the type described in my copending applications Serial Nos. 61,674 and 313,316, with the air and fibers being circulated within the housing **38** in a clockwise direction so that the air and fibers issue from the openings in the separating wall at high velocity at an angle opposite the direction of travel of the collecting wall. Since the fibers issue from the fiber depositing head **37** in a continuous stream of uniform fiber concentration from sidewall to sidewall, it is desirable to cover the surface of the collecting wall with a plurality of masks **39**, interconnected one to another lengthwise and crosswise to form an endless foraminous chain which operates about sprockets **40**, **41**, **42** and **43** to position the masks over the surface of the collecting member **32** in advance of their passage through the fiber depositing zone. The foraminous masking members will be adapted to cover the entire surface of the collecting wall except for the forming space **44** through which the fibers are able to pass to form the fibrous structure of predetermined shape and dimension. The masks travel at the same speed as the collecting wall so that they will pass together without relative movement through the fiber depositing zone.

As the masks and the collecting wall pass beyond the fiber depositing zone, the masks turn about sprocket **40** and separate from the collecting wall, leaving the preformed fibrous structures **24** on the surfaces thereof. As the masks turn upwardly away from the collecting wall, means are provided such as a series of jets **47** supplying compressed air positioned outwardly of the masks, whereby the fibers are blown off the masking screens into the collecting trough **48** for their removal from the surface of the masking screens and their immediate reuse, if desired, for example, by blowing them into the trough **48** feeding the depositing head **37**, the supply of fibers being carried to the inlet **49** of the head by a suitable conveyor **50**. In this way, the masks are reconverted to their original condition for continued travel about sprocket **42** down to sprocket **43**, where the masks turn into cooperative relation to cover the surface of the collecting wall in advance of passage together through the fiber depositing zone.

It will be apparent from this description that the masks may be provided with a series of longitudinally aligned openings, or with a series of staggered forming spaces positioned as desired or to make the most economical use of the space available in the fiber depositing zone and to minimize the amount of fibers deposited in the masking area for recycling or waste, as the occasion may be.

As illustrated in Figure 9, the fibrous structures re-

maining on the surface of the collecting wall 32 after passage through the fiber depositing zone and separation from the mask portion, may be subsequently treated in various ways to effect consolidation and separation or treatment, as by means of the couching roller 51, which engages the surface of the fibrous structures and which are drawn thereon by means of a suction box 52 operating in roller 51, about which the screen 32 operates in cooperation with the idler roller 36. The structures are then caused to be transferred to the endless foraminous belt 53 which passes around roller 54 by the suction box 55 operating therein.

If the elements are individually deposited from air or by gravitational force, such, for example, as when using the apparatus described in my copending apparatus application, Serial No. 286,716, filed on May 18, 1952, and when their spread is limited by a partition, such as by the walls of the trough 15, a random "dry brick" type of construction results, especially with flat elements such as described in my copending application Ser. No. 192,284, filed on October 6, 1950, and now abandoned, which thus provides a remarkably stable edge. The stability of the edge may be further enhanced by making use of a trough having the shape shown in Figure 10 of the drawings, which gives an inward slope to the edge portions of the formed layers of fibers.

When the fibrous elements used to form the structures are relatively smooth and stiff, such as hogged wood waste, or particularly wooden wafers such as described in my copending applications Serial No. 344,088, and now abandoned, and Serial No. 344,089, filed on March 23, 1953 now United States Patent No. 2,773,789, entitled "Cross-cut Fiber and Method of Preparation," and when they are deposited by gravity, and are not held in position where they strike the mat by a vacuum applied thereunder, they can move and slide relatively freely over each other. In consequence, as shown in Figure 11, unlike rougher or more flexible fibers which remain substantially where they fall on the mat by their cohering to, or becoming entwined with neighboring fibers, the stiff, smooth elements slide downwards as they are deposited and, because of the vibration occasioned by the impact of the individual descending elements, the angle of repose of the elements is very small so that the back end of the mat tapers down rearwards for a distance of several times its thickness. In consequence, if a separator trough 15 with vertical sides is employed, a condition illustrated in Figure 12 is obtained in which the elements deposited in front of the trough form an excess 73 and those deposited behind the trough form a deficiency 74. To correct this condition, deflector plates 17a and 18a are added to the vertical sides of the trough as shown in Figure 13. Plate 18a serves to shield the zone in front of the trough so that elements striking its upper surface slide downwardly into the trough, whereas elements striking the rear plate 17a, slide downwardly into the zone behind the trough so as to correct the deficiency and build up the edge of the oncoming mat. By adding these deflector plates at a suitable forward angle so as to permit the elements to slide freely downwards and to the rear, and by adjusting their length to suit the character of the material, the operation of the felting head and the linear speed of travel of the plate 14, the layer of fibers adjacent the trough can be made to be substantially level and of uniform fiber density as illustrated in Figure 14. Furthermore this may be accomplished without interfering with the desired haphazard interfelted relationship which it is desired to have throughout the fibrous structure, especially at its ends so that if the fibrous elements are several times as long as they are thick, they will form a random dry brick wall type of construction at the edges which accordingly remain surprisingly firm and smooth.

Figure 10 illustrates a further modification wherein the trough 15 is formed with walls which extend upwardly angularly from the base with the upper edge of the leading wall formed with an extension disposed angularly rearwardly somewhat in the same direction as the trailing wall of the trough.

The important concept of this invention is to be able to form fibrous structures of any desired shapes on a moving collecting wall and to achieve uniformity with respect to the layer of fibers deposited so as to eliminate variation in density in the front and back edge portions to avoid the necessity for subsequent cutting or shaping operations. The fibers in the end sections are so deposited whereby no variation in density across the structure will result, and even if smooth the fibers will not readily fall away from the edges of thick structures during their subsequent handling .

No matter how the separating troughs or masks are shifted between their starting position in advance of the fiber depositing zone and ending position subsequent to passage through the fiber depositing zone, it is desirable to maintain an angular relation in the deflector plates at the upper edges defining the openings or separations to achieve a desired reaction to deflect the fibers in a direction so as to concentrate the fibers where deficiencies might otherwise exist and to eliminate fibers where mounds might form and thereby to achieve uniformity in a simple and expedient manner.

It will be understood that changes may be made in the details of structure, arrangement and operation without departing from the spirit of the invention, especially as defined in the following claims.

I claim:

1. The method of depositing fibrous elements to form separated preforms of uniform thickness comprising the steps of issuing the fibrous elements in a substantially continuous stream in one direction through a stationary fiber depositing zone with the stream extending continuously crosswise of the zone, advancing an endless surface through the fiber depositing zone for receiving the stream of fibrous elements thereon in interfelted relation to form the fibrous structure, covering said endless surface with a masking member having a base with openings therethrough of the predetermined shape of the preform defined by vertical walls extending upwardly from the base to provide fiber receiving troughs on said base about the openings, moving the masking member at the same linear speed as the endless surface and with said surface through the depositing zone to receive fibrous elements in a layer of uniform thickness across said masking member including the openings therethrough, separating the masking member with the fibers deposited thereon from the surface to leave mats on the surface corresponding to the shape of the openings in the masking member, removing the elements deposited on the masking member, and returning the masking member to cover the surface in advance of passage through the depositing zone.

2. The method of forming fibrous structures of preselected shape upon a moving support therefor by directing a continuous stream of fibrous elements toward said support and extending continuously across the support, placing shaped receptacles on said support, said shaped receptacles having a base with openings therethrough shaped to correspond to the desired structures and defined by walls extending upwardly from the base to provide fiber receiving areas outside of said openings, passing the support and receptacles at a uniform rate through the stream of deposited fibers whereby the fibers are received in a layer of uniform thickness across said receptacles and the openings therein, removing the receptacles with the fibers thereon to leave the desired fibrous structures on the support corresponding to the shape of the openings, and emptying the receptacles and placing them on the support in advance of the stream for the subsequent passage therethrough.

3. The method as claimed in claim 2 in which the

walls of the masking members are inclined at an angle corresponding to the resultant of the angular velocity of the stream of fibrous elements and the rate and direction of the movement of the support as a vector ±15 degrees.

4. The method of depositing fibrous elements to form separated preforms of uniform thickness comprising the steps of issuing fibrous elements in a substantially continuous stream in one direction through a stationary fiber-depositing zone with the stream extending continuously across the zone, advancing a continuous surface through the fiber-depositing zone for receiving the stream of fibrous elements thereon in interfelted relation to form a fibrous structure, covering portions of said continuous surface with masking members whereby the fibrous elements are received in said masking members in the masked portions and deposited on the continuous surface in the unmasked portions, moving the masking members at the same linear speed as the continuous surface and with said surface through the fiber-depositing zone to receive fibrous elements in a layer of uniform thickness across the masking members and the unmasked portions of the continuous surface, separating the masking members and the fibrous elements deposited thereon from the continuous surface to leave mats on the surface corresponding to the unmasked portions of the continuous surface advanced through the fiber-depositing zone, removing the elements deposited in the masking members, and returning the masking members to cover portions of the continuous surface in advance of passage through the fiber-depositing zone.

5. The method as claimed in claim 4 in which the continuous surface on which the fibers are deposited comprises a plurality of separable, rectangularly shaped supporting plates arranged in end-to-end relation during passage through the fiber-depositing zone and in which the masking members extend crosswise of the surface at the meeting edges of the plates to mask the plates across the edge portion adjacent to the meeting edges.

6. The continuous deposition of fibrous elements to form rectangular fibrous mats as claimed in claim 4, in which the masking is in the form of troughs formed with deflector plates in the upper edge portions thereof having a longitudinal tilt corresponding substantially to the resultant of the angular velocity of the fibers deposited on the surface and the linear speed and direction of the surface as vectors.

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