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Castor

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[54] **APPARATUS FOR PRODUCING CAST FABRICS**

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Related U.S. Application Data

[62] Division of Ser. No. 185,736, Oct. 1, 1971, abandoned.

[52] **U.S. Cl.** **19/89,** 19/83, 19/96, 19/156.3, 425/84

[51] **Int. Cl.** **D01g 25/00**

[58] **Field of Search** 19/88, 89, 105, 155, 156-19/156.4, 83, 96; 241/58

[56] **References Cited**

UNITED STATES PATENTS

2,518,744	8/1950	Barnard	19/156.3 UX

FOREIGN PATENTS OR APPLICATIONS

883,139	11/1961	Great Britain	19/89
1,010,147	11/1965	Great Britain	19/156.4

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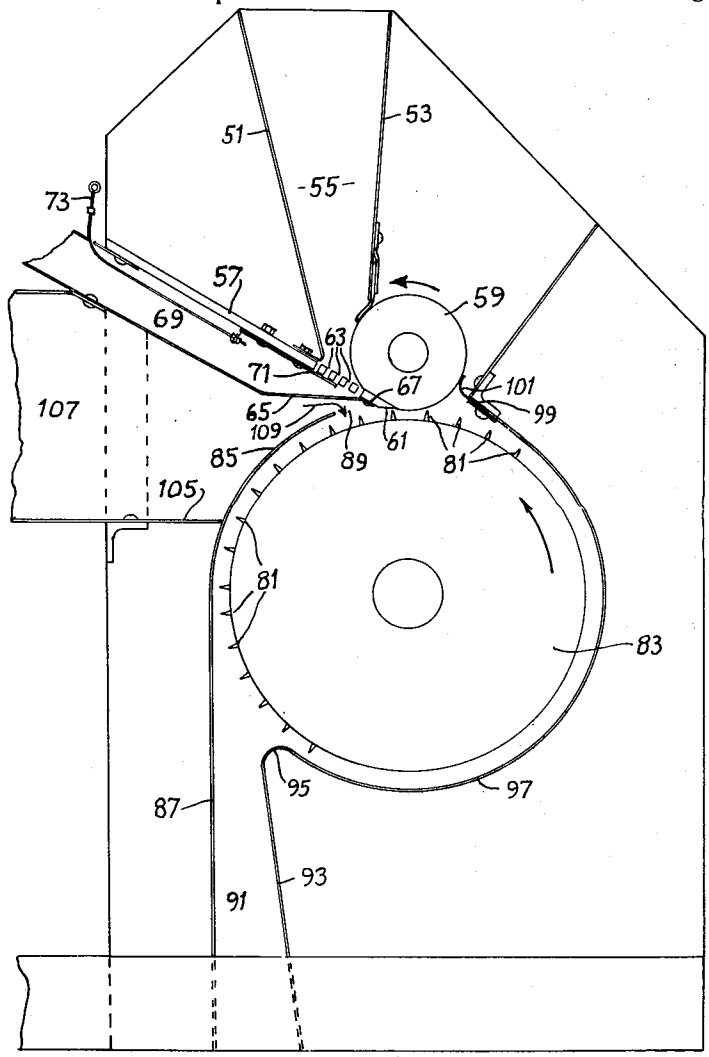
[57] **ABSTRACT**

One or more casting heads move laterally back and forth relative to the longitudinal motion of a forming conveyor onto which each casting head deposits fibers in random orientation, by means of an air current. Each casting head feeds fibers to a feed roll which advances the fibers to the sharp edge of a snubbing bar or nose bar in close proximity to the ends of a multiplicity of teeth formed by pins on a rapidly rotating beater roll. The action of the pins assisted by a current of air bends the fibers around the edge of the snubber bar and combs the fibers to separate them individually from each other. The fibers thus loosened from each other follow around with the pins of the beater roll for some distance and then are discharged approximately tangentially through a discharge conduit or flying bridge which directs the fibers in random orientation into close proximity to the forming or condensing conveyor onto which the fibers are deposited in random fashion so that the resulting web of cast fabric is substantially isotropic, having equal strength in any direction. When several casting heads are used, different kinds or colors of fibers, or different composite mixtures of fibers, may be used in different casting heads. The lateral motion of the casting heads permits the fibers to be deposited in various patterns.

4 Claims, 4 Drawing Figures



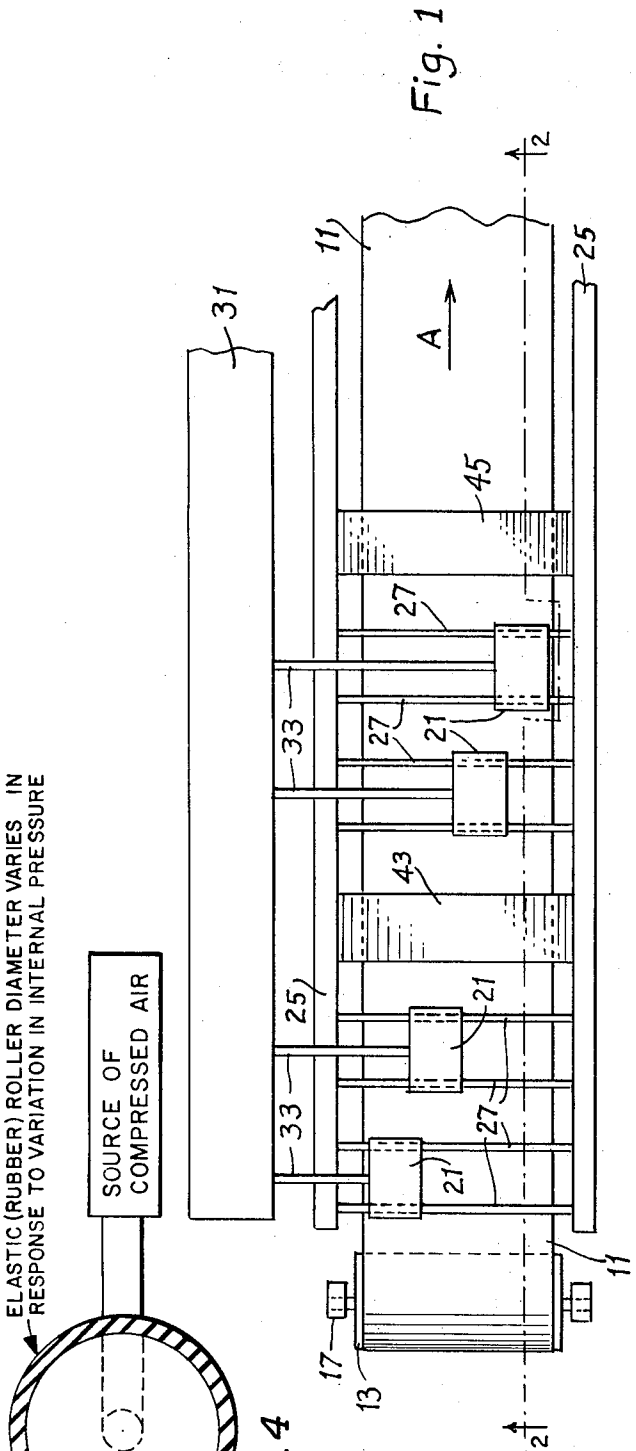


Fig. 1

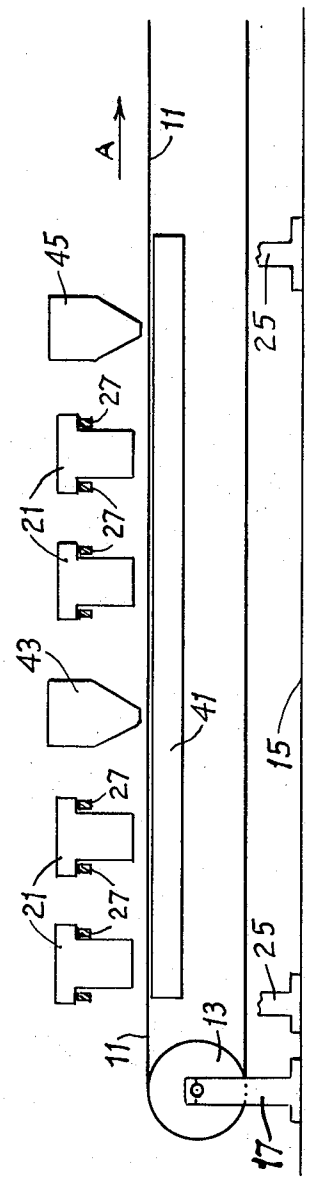
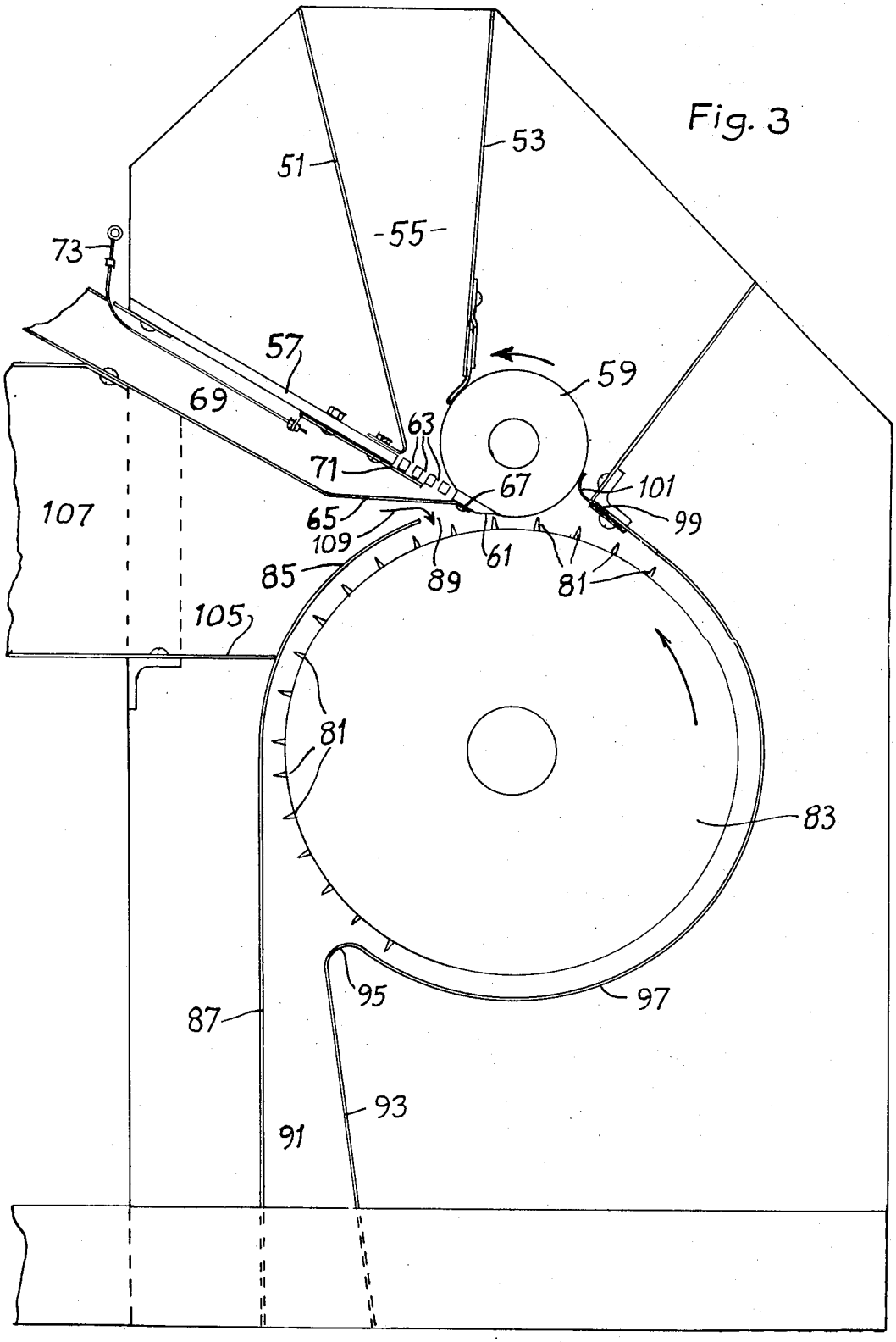


Fig. 2

Fig. 4

Fig. 3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APPARATUS FOR PRODUCING CAST FABRICS

CROSS-REFERENCE TO RELATED APPLICATION

This application is a division of application Ser. No. 185,736, filed Oct. 1, 1971, now abandoned.

BACKGROUND OF THE INVENTION

The air stream deposit of fibers onto a moving conveyor, to produce a nonwoven or cast fabric web, is broadly known in the art. Typical examples of the prior art are the methods and apparatus disclosed in the following U.S. Pat. Nos.:

2,451,915, Oct. 19, 1948, Buresh
2,700,188, Jan. 25, 1955, Buresh and Langdon
2,703,441, Mar. 8, 1955, Langdon and Buresh
2,890,497, June 16, 1959, Langdon, Buresh, Castor and Marks.

The present invention constitutes an improvement over the prior art as exemplified in the above listed patents.

An object of the present invention is the provision of a generally improved and more satisfactory method for producing cast fabrics, and particularly a method enabling the production of a "pattern" fabric having variations in color, in thickness, in material, or otherwise, either transversely across the width of the web which is being produced, or longitudinally along the length of such web, or in a direction through the thickness of the web, or in any desired combination of any two or all three of these directions.

Another object of the invention is the provision of generally improved and more satisfactory apparatus for producing a cast fabric, and particularly the provision of simple, sturdy, and relatively inexpensive apparatus enabling the production of a web of cast fabric with a "pattern" or variation either transversely across the width of the web, or longitudinally along the length of the web, or in a direction through the thickness of the web, or in any combination thereof, which variation may be either in color, in character composition of the fibers, in thickness of the web, or in other variable characteristics.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a schematatic top plan view of apparatus in accordance with a preferred embodiment of the invention;

FIG. 2 is a schematic fragmentary view of the same partly in side elevation and partly in vertical section approximately on the line 2—2 of FIG. 1;

FIG. 3 is a schematic cross section taken centrally through a casting head according to a preferred embodiment of the invention;

FIG. 4 is a schematic view illustrating the elastic roller of variable diameter in response to variable internal pressure.

DESCRIPTION OF THE PREFERRED EMBODIMENT

Referring first to FIGS. 1 and 2, which show the general features of the apparatus, the casting conveyor or casting screen, often referred to as the condenser, is shown at 11, and passes over a roller 13 at one end of the conveyor, and a similar roller (not shown) at the other end. The roller 13 is supported a suitable distance above the floor 15 by conventional brackets or frame members 17. Most of the frame members are omitted

entirely or shown only fragmentarily in the present drawings, as the frame can be made in any conventional way according to the skill of the art, and the details thereof are not important for purposes of the present invention.

The casting screen or condenser is of the usual foraminous construction, well known in the art and somewhat similar to the fine mesh screen used on a Fourdrinier paper making machine. Any conventional driving means may be used for driving the upper stretch or reach of the screen in the direction of the arrow A.

Several casting heads are provided, for casting loose fibers onto the screen or condenser 11, in order to form thereon a non-woven fabric of interlaced fibers extending in random directions. Four such casting heads are here illustrated at 21, although the number may be greater or smaller. It is usually preferred to use about eight or 10 of such casting heads. One of the important features of the invention is that the casting heads are preferably not mounted in stationary position, but are mounted for lateral movement back and forth across the width of the condenser screen 11, or across any desired part of such width, not necessarily traversing the entire width.

These casting heads may be mounted either above or below the condenser conveyor, to cast the fibers either downwardly onto the top reach of the conveyor, or upwardly onto the bottom reach thereof. The air stream issuing from the casting head, combined with the air flowing through the screen as a result of a vacuum box immediately above the lower reach of the screen, will cause proper deposit of the fibers onto the screen even when the casting heads are located below the screen and cast upwardly onto the lower reach thereof. In such a case, the end roller toward which the lower reach travels (for example, the roller 13 in FIG. 2) is perforated and a partial vacuum is produced within the roller, thus causing the formed fabric to cling to the screen as it passes around the roller until it gets to the upper reach of the screen, where the fabric rests by gravity until it is removed from the screen at the opposite end of the upper reach.

Although casting upwardly onto the lower reach of the condenser screen is entirely possible, as above stated, it is usually preferred to cast downwardly onto the upper reach, and this is the arrangement illustrated in FIGS. 1 and 2. On a suitable stationary frame, only fragments of which are shown at 25, there are cross rails or guides 27 extending transversely across the width of the upper reach of the condenser screen 11, at a suitable elevation above the screen. The casting heads 21 either rest on or are supported by carriages which rest on these transverse guides or rails 27. The casting heads are individually reciprocated back and forth across the width of the condenser screen, or across any desired part of such width, by any suitable reciprocating mechanism, indicated schematically by the rectangle 31 representing the housing or casting of the reciprocating mechanism, and by the connecting members 33 in the form of rods, chains, or other suitable connectors which drive each casting head 21 individually from the reciprocating mechanism 31.

The details of the reciprocating or traversing mechanism are not important for purposes of the present invention. Any conventional mechanism capable of producing a reciprocating motion may be used. For example, the mechanism may produce the motion by hy-

draulic or pneumatic cylinders, or by cranks with connecting rods connected to the casting heads, or by gearing operating chains or belts which pull the casting heads first in one direction and then in the opposite direction along their respective rails or tracks **27**. Preferably the reciprocating or traversing mechanism is individually adjustable or variable with respect to each individual casting head, so that each casting head may, if desired, be reciprocated at a rate or speed different from that of others, any may be moved through a range or distance different from that of others, and may be moved out of phase or out of synchronism with the movements of other casting heads even if it moves at the asme rate and through the same distance. By taking advantage of these variables, the machine may be set up to produce cast fabric in any desired pattern thicker or thinner at various points transversely or at various points longitudinally, or with different types or different colors of fibers at various points laterally or longitudinally, and so on.

When the fibers are cast downardly onto the upper reach of the casting or condensing screen, gravity assists the deposit of the fibers on the screen, and it may not be necessary to provide a vacuum box immediately under the screen. However, in many cases such a vacuum box is desirable to improve the deposit and retention of the fibers on the screen, and a vacuum box is schematically shown at **41** in FIG. **2**. As will be understood by those skilled in the art, this is a box closed at all lateral sides and at the bottom, and open at the top. The side edges come up very close to the bottom surface of the screen, so that when a partial vacuum is applied to the box **41**, it sucks air downwardly through the foraminous screen **11**.

If desired, provision may be made for adding adhesive material, or coloring matter, or both, to the fabric either at points between successive casting heads, or beyond the last casting head. The material to be added may be in the form of a dry powder or granules, or in the form of a liquid spray. One depositing device is indicated schematically at **43**, located between certain of the casting heads, and another is indicated schematically at **45**, following the last casting head. Either or both of these elements **43** and **45** may, for example, deposit a thermoplastic adhesive material. At a subsequent stage of the movement of the formed fabric, further along beyond the last casting head and the last depositing element, the cast fabric may be run through a heated tunnel where it is heated to a sufficient temperature so that the thermoplastic adhesive is activated to cause the fibers to adhere to each other. Of course one or more of the casting heads may also be used to cast fibers which themselves are of an adhesive nature, thermoplastic or otherwise, becoming activated on subsequent passage of the fabric through a heating zone or other activating zone.

The general nature of the apparatus will now be understood from what has been said above regarding FIGS. **1** and **2** of the drawings, and the general nature of the process or method of the present invention will also be understood from the foregoing description of one form of apparatus for carrying out the process or method.

Another aspect of the present invention relates to the detailed construction of the casting head itself. Referring now to FIG. **3** of the drawings, there is shown a casting head which is particularly suitable for use in the apparatus above described in connection with FIGS. **1** and **2**, where the casting head moves laterally or transversely with respect to the travel of the casting or condensing screen. But it must be understood that the casting head now to be described in connection with FIG. **3** is useful also as a fixed or stationary casting head and does not necessarily have to be reciprocated transversely of the casting screen.

Referring now to FIG. **3**, the preferred form of casting head comprises walls **51** and **53** which, together with suitable end walls, form a somewhat tapered hopper **55** into which a loose mass of fibers is placed. The manner in which the fibers reach the hopper **55** is not important for purposes of the present invention, and the deposit of fibers into the hopper may be done in various ways, as for example by hand, or by mechanical conveyors or blowers of one type or another.

The bottom of the hopper is formed by an inclined plate **57** which may be called the snubber plate or nose plate, and which works in conjunction with a feed roll **59** rotating in the direction of the arrow and in contact or almost in contact with the upper surface of the snubber plate at the extreme lower end thereof, just above the extreme lower edge **61** of the snubber plate. It will be observed from the drawing that this extreme lower edge is formed at an acute angle, forming a rather sharp edge which, however, is very slightly rounded off on a small radius of, say, about 0.002 of an inch so that it does not form a cutting edge likely to cut or damage the fibers fed over this edge, although it does provide a sharp or acute corner over which the fibers must pass and must bend as they pass it.

This lower edge of the snubber plate, with its sharp corner, may be integral with or may be separate from and attached to the main body of the snubber plate **57**, but in any event it is conveniently called the snubber bar on the nose bar, and it extends across the full width of the casting head. A little above the lower edge of the snubber plate, in the area between the upper wall **51** and the point where the feed roll **59** engages the plate, the plate **57** is provided with a multiplicity of slots or other small openings **63**, of exaggerated size in FIG. **3** for the sake of clarity, but actually sufficiently small so that there is little or no danger that the tufts of fibers coming down the hopper **55** will pass through or become entangled in these openings **63**. A wall **65**, attached to the lower face of the snubber bar at **67** and thence extending angularly away from the snubber bar, forms together with the snubber plate an air passage **69** leading to a fan or other suitable device for producing a partial vacuum in the passage **69**, to tend to suck air downwardly through the small openings **63**. This current of air, passing downwardly through the hopper **55**, assists gravity and helps to keep the tufts of fibers (or the lap of fibers, if the hopper **55** is fed with a lap rather than with tufts) moving downwardly until the fibers can come under the influence of the feed roll **59**, which grabs the fibers in the nip between the feed roll and the snubber bar or nose bar, and advances them down the nose bar toward the sharp edge or corner thereof.

The upper face of the snubber plate **57**, including the lower portion or nose bar portion **61** thereof, is provided with a low friction coating, such as teflon. The feed roll **59** has a high friction coating or surface, such as rubber. In fact, in FIG. **4** the feed roll is conveniently in the form of a hollow rubber cylinder which can be inflated, like an automobile tire, to various different

pressures, through a suitable axial opening in the axle or trunnion of the roll. Differences in the inflation pressure will cause some difference in the diameter of the feed roll, so that by adjusting the pneumatic pressure within the feed roll **59**, the diameter thereof may be slightly altered, to produce just the desired extent of contact and extent of pressure on the snubber bar, appropriate to the particular kind or size of fibers being used.

The extent of air flow through the openings **63** should also be varied in accordance with the kind and size of fibers. To this end, the lower face of the snubber plate **57** is provided with a sliding shutter member **71** which can be slid up or down the incline of the snubber plate, by adjusting mechanism such as the handle **73**, permitting the shutter plate **71** to cover more or less of the various openings **63**. This provides a working adjustment, to be adjusted by the operator from time to time in accordance with the kind and size of the fibers employed, to secure just the right degree of air flow to carry the fibers into the nip of the feed roll **59**.

The feed roll feeds the fibers past the angular edge **61** of the nose bar, into the path of travel of a multiplicity of teeth or points **81** mounted on the beater roll **83** which revolves at high speed. These points just barely miss the under surface of the nose bar **61**, and will produce a combing or carding action on the fibers fed over the edge of the nose bar by the feed roll, which fibers dangle from the nose of the feed bar until engaged by the pins **81**. These pins, plus the action of the mass of air entrapped between the pins, bends the fibers around the sharp edge of the nose bar, and the pins serve to separate the fibers from each other, producing individual fibers from what was previously a tuft or lap or mat of fibers. The beater roll **83** rotates at great speed in the direction of the arrow, that is, in a counterclockwise direction when viewed as in FIG. **3**, which is a direction opposite to the movement of the adjacent face of the feed roll **59**.

Various speeds are possible, but in any event, the beater roll **83** operates at a peripheral speed much greater than the peripheral speed of the feed roll **59**. For example, the pins or teeth **81** on the beater roll may travel at a speed from about 7,000 inches per minute to about 7,000 feet per minute, while the surface of the feed roll **59** may travel at a much slower speed of about 1 inch per minute to 1 foot per minute. These speeds are mentioned only as typical examples. The exact speeds of driving both the feed roll and the beater roll may be adjusted until best results are obtained with the particular kind and size of fibers being used.

Good results are usually obtained when the pins **81** are approximately 0.078 inch in diameter, and protrude a quarter of an inch from the surface of the beater roll **83**, and are tapered through this protruding quarter of an inch to a sharp point. The pins are placed on the beater roll in such numbers and in such locations relative to each other, that at least one pin will pass the adjacent face of the snubber bar every 0.050 of an inch across the entire width of the snubber bar. Preferably they are installed on the cylindrical beater roll in a truly radial direction, that is, with no rake, and they are round, hard, and fully polished.

A curved wall or casing **85**, concentric with the beater roll **83**, surrounds a portion of the beater roll, just outside the ends of the pins **81**, from a point near the snubber bar **61** to a suitable discharge point, at which the wall becomes tangential as at **87**, rather than arcuate and concentric with the beater roll. It will be noted that the curved wall **85** does not start right at the snubber bar **61**, but is spaced somewhat away from it, leaving a gap or opening **89** between the snubber bar and the adjacent end of the concentric wall **85**. This gap or opening **89** may be called the pyloric opening or port, and will be further referred to below.

The tangential wall **87** forms one side of the discharge conduit **91**, conveniently called the flying bridge, while the other side thereof is formed by the straight wall **93** diverging slightly from the wall **87**. The wall **93** leads from a sharply curved portion **95** which connects the straight wall **93** to a concentric wall portion **97** which continues on around the remainder of the circumference of the beater roll **83**, just outside the ends of the teeth or pins **81**, where it terminates at a point **99** fairly close to the feed roll **59**. The gap between the wall end **99** and the feed roll is closed by a piece **101** of stiff leather or the like, bearing against the surface of the feed roll and serving to prevent any substantial flow of air out of the casing or housing at this point.

The sharply curved portion **95** of the housing may be referred to as the doffer. It is here that the mass of individual fibers, combed and separated by the action of the teeth or pins **81**, leave the pins and go out through the flying bridge **91**, from which they are deposited onto the casting or condenser screen previously mentioned.

The circumferential distance from the snubber or nose bar **61** to the doffer **95** and the exit conduit or flying bridge **91** is not critical. In the particular construction shown in FIG. **3**, the flying bridge starts at roughly about 90° central angle from the snubber bar **61**; that is, about a quarter of the periphery of the beater roll, beyond the snubber bar. But it is equally satisfactory to place the doffer and the flying bridge at a lesser distance or a considerably greater distance from the snubber bar, placing them at about half of the circumference or even about three-quarters of the circumference around from the snubber bar. The exact location will depend merely upon the angle at which it is desired to place the feeding hopper and the snubber bar with respect to the angle at which it is desired to discharge the fibers through the flying bridge, and this, in turn, will depend at least to some extent on the manner in which it is desired to feed fibers to the hopper **55**, and the direction in which fibers are to be discharged from the flying bridge, whether downwardly onto the top reach of the condenser screen, or upwardly onto the bottom reach thereof.

Extending outwardly from the curved wall **85**, at some distance from the wall **65**, is a wall or partition **105** to form, between it and the wall **65**, an air pressure chamber **107** into which air is forced by a suitable fan or air pump, to be discharged from this chamber through the pyloric opening **89**. This flow of air through the pyloric opening, in the direction of the arrow **109**, tends to act on the trailing ends of the fibers that may be bent around the sharp nose of the snubber bar **61** or otherwise trailing from this bar, and the air current tends to keep such fibers down in the path of travel of the sharp points **81** on the beater roll, where the fiber can be acted upon by these points or pins and can be separated one from another and pulled loose from the snubber bar.

Another function of the pyloric opening **89** is to provide for flow of air into the spaces between the pins **81**, to flow around with these pins and exit through the flying bridge **91**, helping to pull the fibers away from the pins at the vicinity of the doffer **91**, and also furnishing the air current necessary to cause the fibers floating in the air current to impinge upon the casting screen or condenser screen.

Where the casting head is used in a stationary location, the fans or other devices for producing a partial vacuum in the chamber **69** and for producing a superatmospheric pressure in the chamber **107** may be located, if desired, at some distance from the casting head, and one set of fans or other devices may serve for a plurality of casting heads, being connected to them through suitable conduits. However, where each casting head is mounted for reciprocating movement transversely of the direction of movement of the condenser screen, as in the preferred embodiment of the invention, it is then preferred to have each casting head provided with its own individual set of fans or other devices for producing the desired vacuum in the chamber **69** and pressure in the chamber **107**. Such fans, driven by suitable electric motors, may be of any conventional kind known in the art, and may be mounted on the casting head structure to move bodily therewith, the motors being supplied with current through suitable flexible electric cords or other electric connections. The blower or fan units are preferably of such character as to produce a vacuum equivalent to about three inches of water, in the vacuum chamber **69**. The pressure within the pressure chamber **107** may also be of the order of about three inches of water, or more, and air should be supplied to the pyloric opening in sufficient volume to cause flow of about 25 cubic feet or air per minute per inch of length of the feed roll.

To give a few more dimensions, merely as typical examples and not as limitations, the end of the snubber bar **61** is preferably so arranged that the lower face of the snubber bar, approximately concentric with the beater roll, is within about 0.005 of an inch from the tips of the points of the pins **81**, although a greater separation than this is frequently satisfactory with some types of fibers. But with this preferred setting, the fibers passing between the snubber bar **61** and the feed roll **59** are forced by the passing action of the beater teeth to make an abrupt turn at the edge of the snubber bar, and are forced against and into the pins by the action of the point of the snubber.

The walls **87** and **93** of the flying bridge **91** preferably diverge from each other through an angle of about 7°. The length of the flying bridge can be varied. This length determines to a great extent the speed of the fibers as they arrive at the collection device or condenser screen. Fibers passing through the flying bridge should have sufficient air with them so that each fiber is encapsulated with a ball of air whose diameter is equal to the length of the fiber. The passage of the fibers encapsulated in air, through the flying bridge, makes possible full disorientation of the fibers, so that the fibers extend in completely random directions by the time they arrive at the condensing screen, thereby producing an isotropic web on the condensing screen or collection device, having approximately equal strength in all directions rather than having greater strength in one direction than in another. A length of about 6 inches from the beater doffer **95** to the discharge end of the flying bridge **91** has been found to be satisfactory for most fibrous products.

The present invention is not concerned with the manner in which the formed fabric is treated or handled after it is formed. It is, of course, lifted off of the forming or condensing screen at a suitable point along the travel thereof, and is rolled into a roll or cut into pieces, as desired, all in accordance with known ways of handling fabrics, the details thereof being unimportant for present purposes.

The fabrics made by the present apparatus and according to the present method are useful in many ways. For example, they may be used as padding or stuffing for packaging fragile articles, since the present cast fabrics may be made in all desired thicknesses from very flimsy sheets weighing only about half an ounce or less per square yard, or about 15 grams per square meter, up to very thick bulky sheets as much as 15 or 20 inches thick, if desired. The thickness depends on the number of casting heads used, and the rate at which the heads deposit fibers on the casting screen, with relation to the rate of movement of the casting screen. When using a large number of casting heads while moving the casting screen very slowly, a thick product will be produced. When using only a few casting heads while moving the casting screen relatively rapidly, a relatively thin and flimsy sheet will be produced. Infinite variations are possible.

It is also possible, as partially indicated above, to produce colored layers within the thickness of the fabric, by feeding colored fibers to one or more of the casting heads at intermediate points along the line of casting heads. These interior colored layers may be used for identification of the product. Of course colored fibers may also be used in the first or last casting head, to produce a colored surface on one side or the other of the fabric, for decorating or other purposes. If, for example, only the last casting head is provided with colored fibers, and if this head is reciprocated back and forth transversely at a relatively slow speed compared to the speed of travel of the condenser screen, it is seen that this casting head will lay down a wavy or sinuous colored strip on the upper surface of the material, which may have decorative or novelty value if the product is used, for example, as a wall hanging.

The present method and present apparatus may employ fibers of practically any kind, natural or artificial, and of any length, commonly used in the industries which deal with fibers, especially the lengths commonly used in making various kinds of fabrics. Thus for example, cotton, woolen, or linen fibers may be used, as well as a great variety of artificial or synthetic fibers.

What is claimed is:

1. A casting head for preparing random-oriented airborne fibers and casting such fibers onto a receiving surface, said casting head comprising a rapidly rotating beater roll having a multiplicity of teeth on the periphery thereof, a snubber member having a relatively sharp angular edge formed between two surfaces at an acute angle to each other, said edge extending parallel to the axis of rotation of said beater roll and facing in a direction opposite to the rotation of said beater roll, the second one of said two surfaces extending from said edge in the direction of rotation of said beater roll and in close proximity to the other ends of said teeth, a housing enclosing and approximately concentric with said beater roll and relatively close to the outer ends of

said teeth throughout a substantial part of the circumference of the beater roll and having a flying bridge exit conduit arranged approximately tangentially to said beater roll at a location spaced circumferentially from said snubber member, means for feeding masses along the first one of said two surfaces toward said angular edge at a relatively slow rate compared to the peripheral speed of rotation of said beater roll, so that subh fibers will project beyond said angular edge into the path of travel of said teeth and be bent thereby around said angular edge and will tend to be forced against said second surface of said snubber member and be subjected to the action of said teeth to be combed thereby to separate masses of fibers into individual fibers, and means for introducing air under pressure into said housing adjacent the trailing edge of said second surface of said snubber member to supply a stream of air to assist in maintaining the fibers in individual spaced relation to each other and in pressing the fibers into cooperative relation to said teeth and in carrying the fibers around part of the circumference of the beater roll and out through said flying bridge exit conduit in random-oriented relation to each other, said feeding means comprising a feed roll cooperating with said first surface of said snubber member relatively close to the angular edge thereof, said feed roll including a fluid tight elastic periphery capable of expanding and contracting in response to variations of fluid pressure within said feed roll, to vary the diameter of the feed roll and vary the relation of the periphery thereof to said first surface.

2. A casting head for preparing random-oriented airborne fibers and casting such fibers into a receiving surface, said casting head comprising a rapidly rotating beater roll having a multiplicity of teeth on the periphery thereof, a snubber member having a relatively sharp angular edge formed between two surfaces at an acute angle to each other, said edge extending parallel to the axis of rotation of said beater roll and facing in a direction opposite to the rotation of said beater roll, the second one of said two surfaces extending from said edge in the direction of rotation of said beater roll and in close proximity to the outer ends of said teeth, a housing enclosing and approximately concentric with said beater roll and relatively close to the outer ends of said teeth throughout a substantial part of the circumference of the beater roll and having a flying bridge exit conduit arranged approximately tangentially to said beater roll at a location spaced circumferentially from said snubber member, means for feeding masses of fibers along the first one of said two surfaces toward said angular edge at a relatively slow rate compared to the peripheral speed of rotation of said beater roll, so that such fibers will project beyond said angular edge into the path of travel of said teeth and be bent thereby around said angular edge and will tend to be forced against said second surface of said snubber member and be subjected to the action of said teeth to be combed thereby to separate masses of fibers into individual fibers, and means for introducing air under pressure into said housing adjacent the trailing edge of said second surface of said snubber member to supply a stream of air to assist in maintaining the fibers in individual spaced relation to each other and in pressing the fibers into cooperative relation to said teeth and in carrying the fibers around part of the circumference of the beater roll and out through said flying bridge exit conduit in random-oriented relation to each other, said feeding means comprising a feed roll cooperating with said first surface of said snubber member, said first surface includes a portion forming a wall of a hopper for receiving incoming fibers to be fed to said angular edge, said portion has a plurality of small openings therein in a location close to and spaced upstream from said feed roll, and means for withdrawing air from said hopper through said openings to create in said hopper an air current tending to carry fibers toward said feed roll.

3. A casting head as defined in claim 2, further including adjustable shutter means for controlling flow of air through said openings.

4. Apparatus for producing a cast fabric comprising conveyor means movable in a longitudinal direction, casting head means for preparing air-borne fibers and depositing them on said conveyor means, and means for causing said fibers to be deposited on said conveyor means in locations varying laterally with respect to the longitudinal motion of said conveyor means while said conveyor means moves longitudinally, said casting head means including a plurality of casting heads said means for causing fibers to be deposited in laterally varying locations including means for reciprocating each of said casting heads back and forth laterally, transverse to the direction of longitudinal movement of said conveyor means, at least one of said casting heads comprising a rapidly rotating beater roll having a multiplicity of teeth on the periphery thereof, a snubber member having a relatively sharp angular edge formed between two surfaces at an acute angle to each other, said edge extending parallel to the axis of rotation of said beater roll and facing in a direction opposite to the rotation of said beater roll, the second one of said two surfaces extending from said edge in the direction of rotation of said beater roll and in close proximity to the outer ends of said teeth, a housing enclosing and approximately concentric with said beater roll and relatively close to the outer ends of said teeth throughout a substantial part of the circumference of the beater roll and having a flying bridge exit conduit arranged approximately tangentially to said beater roll at a location spaced circumferentially from said snubber member, means for feeding masses of fibers along the first one of said two surfaces toward said angular edge at a relatively slow rate compared to the peripheral speed of rotation of said beater roll, so that such fibers will project beyond said angular edge into the path of travel of said teeth and be bent thereby around said angular edge and will tend to be forced against said second surface of said shoulder member and be subjected to the action of said teeth to be combed thereby to separate masses of fibers into individual fibers, and means for introducing air under pressure into said housing adjacent the trailing edge of said second surface of said snubber member to supply a stream of air to assist in maintaining the fibers in individual spaced relation to each other and in pressing the fibers into cooperative relation to said teeth and in carrying the fibers around part of the circumference of the beater roll and out through said flying bridge exit conduit in random-oriented relation to each other.

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