July 15, 1952 W. J. FISCHBEIN 2,602,960

PRESS FOR THE MANUFACTURE OF CONTINUOUS WEB MATERIAL

Filed Nov. 18, 1949 5 Sheets-Sheet 1

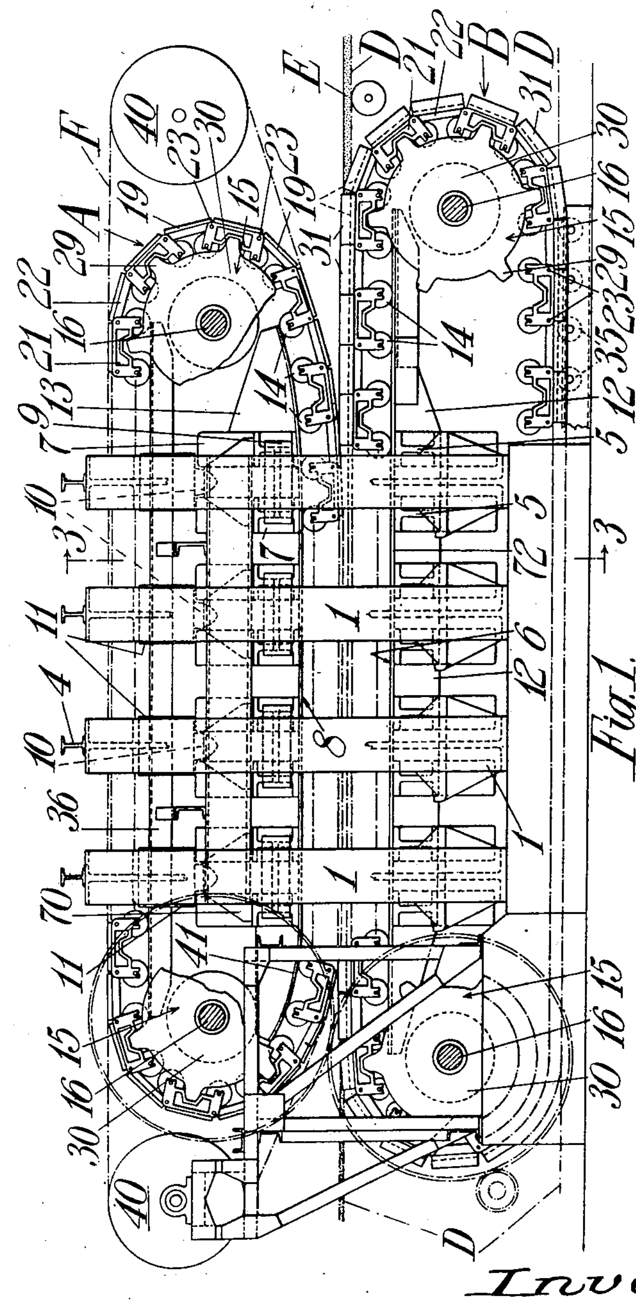

Fig.1.

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PRESS FOR THE MANUFACTURE OF CONTINUOUS WEB MATERIAL

Filed Nov. 18, 1949 5 Sheets-Sheet 2

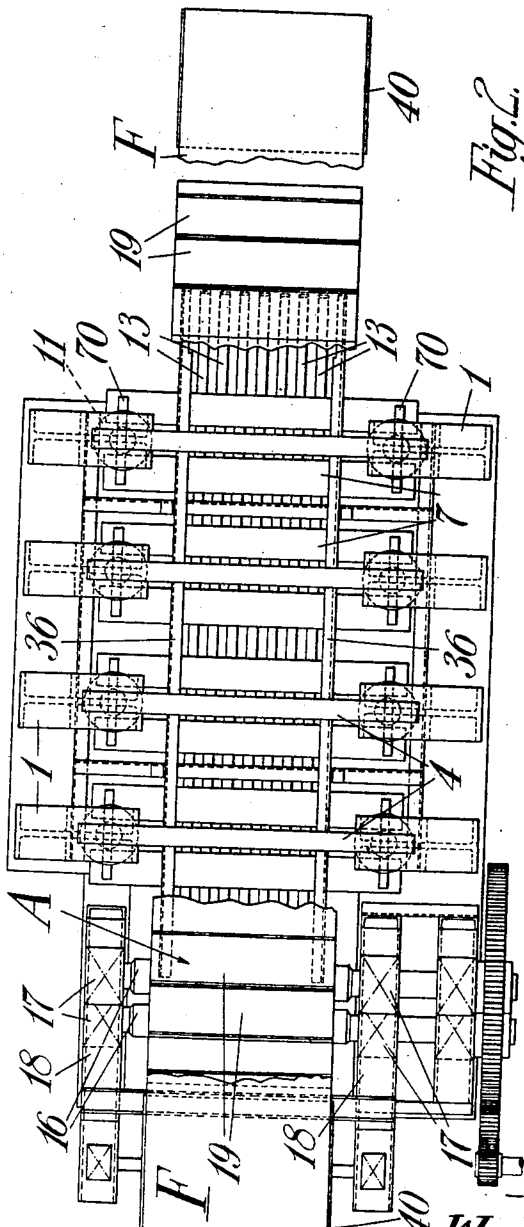

Fig. 2

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PRESS FOR THE MANUFACTURE OF CONTINUOUS WEB MATERIAL

Filed Nov. 18, 1949 5 Sheets-Sheet 3

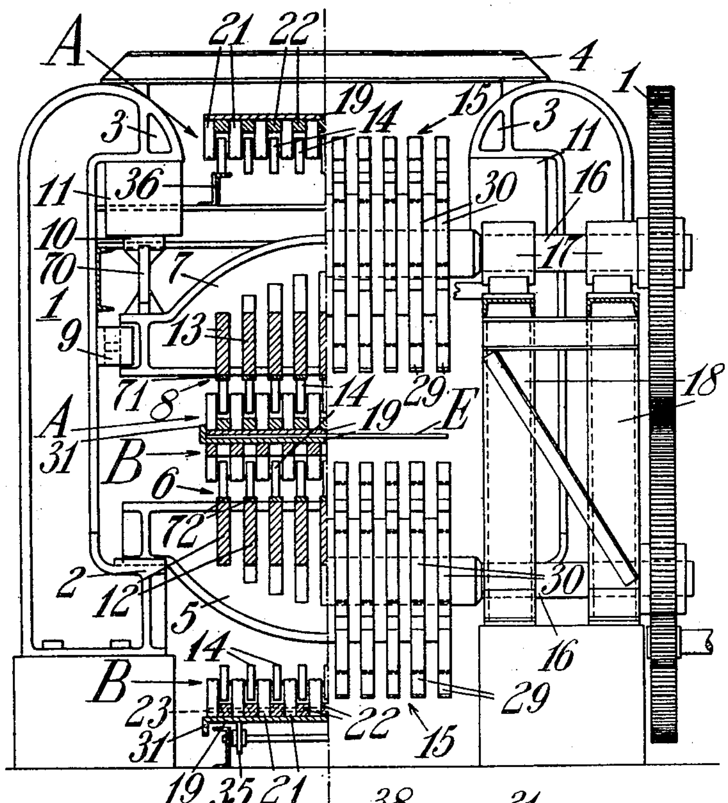

Fig. 3.

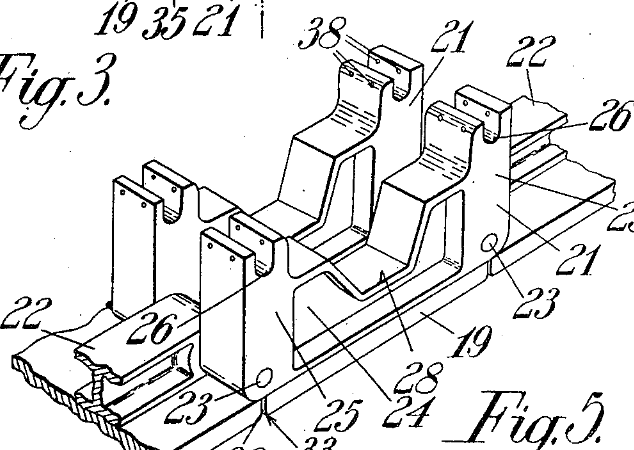

Fig. 5.

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PRESS FOR THE MANUFACTURE OF CONTINUOUS WEB MATERIAL

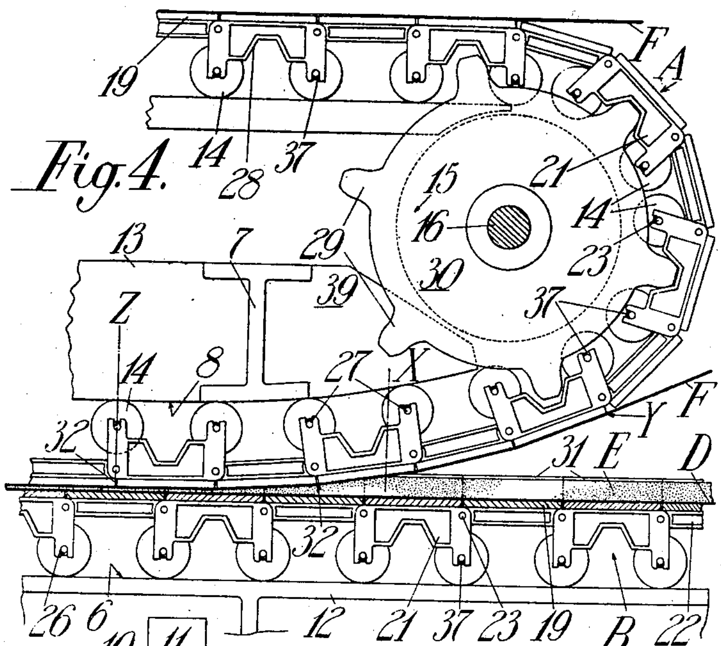

Fig. 4.

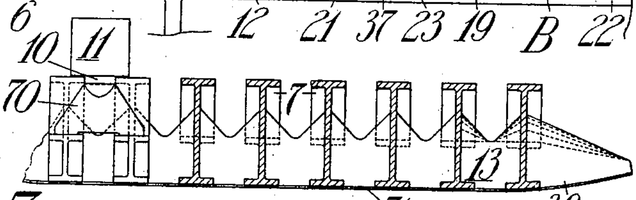

Fig. 7.

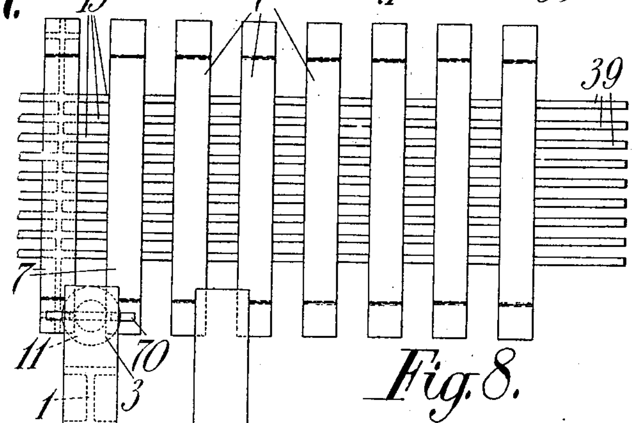

Fig. 8.

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PRESS FOR THE MANUFACTURE OF CONTINUOUS WEB MATERIAL

Filed Nov. 18, 1949 5 Sheets-Sheet 5

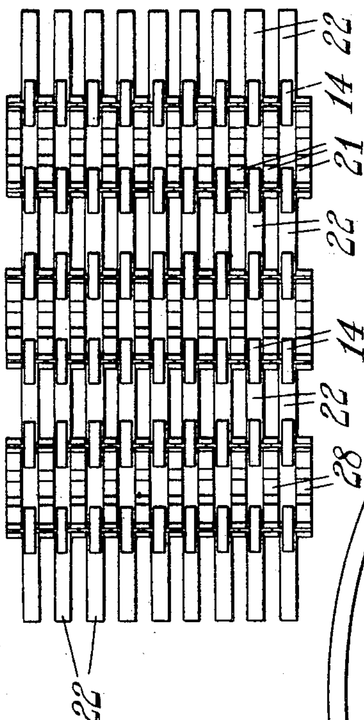

Fig. 6.

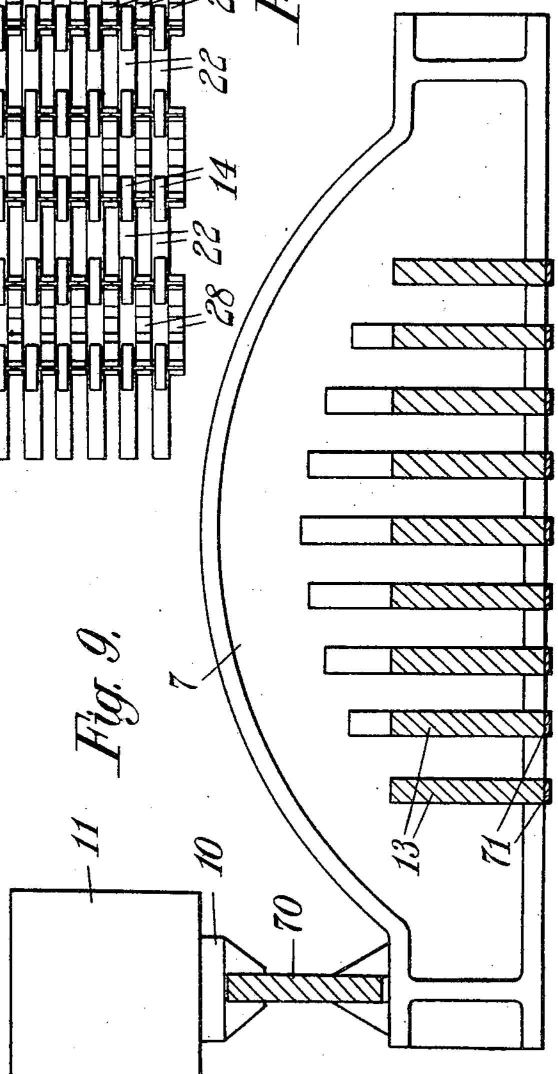

Fig. 9.

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Patented July 15, 1952 **2,602,960**

UNITED STATES PATENT OFFICE

2,602,960

PRESS FOR THE MANUFACTURE OF CONTINUOUS WEB MATERIAL

William James Fischbein, London, England, assignor of one-half to British Artificial Resin Company Limited, London, England

Application November 18, 1949, Serial No. 128,199
In Great Britain November 24, 1948

4 Claims. (Cl. 18—16)

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This invention relates to caterpillar presses of the character described in British patent specification No. 595,423 (of which the present company are copatentees) for the manufacture, under heat and pressure, in continuous web or long sheet form of wallboard, sheeting or panelling or like material (hereinafter called wallboard) having a large surface area in relation to thickness, an aim of the invention being to provide a machine essentially capable of manufacturing such wallboard from a mixture of a discrete filler, such as sawdust or other comminuted fibrous or cellulosic or other material bound with a thermo-setting plastic, in such a manner that the product is of uniform gauge throughout without waves or zones of overcompression or transverse surface marks.

In machines of the character indicated where the material under treatment is pressed between metal bands backed by lower and upper platen roller chains running on pressure applying rails or beds, difficulties arise, particularly when treating a mixture or composition including a thermosetting binder or other bonding material in reference to which curing or setting starts at an early stage under the heat and pressure treatment.

It will be appreciated that if pressure is gradually applied over a prolonged period as in the case where the pressure tracks converge over their length of travel, final gauging is deferred to the end of the treatment and consequently very much greater pressure would have to be employed to secure the required consolidation and gauge, if at all practicable, owing to the fact that the material will have reached an advanced curing stage.

For these reasons it is essential to apply the pressure for bringing the material to its final gauge and consolidation during a relatively short longitudinal travel in the initial stage when the material first comes between the pressure elements and which may conveniently be referred to as a squeezing zone, and thereafter to maintain pressure to prevent recovery or reactive swelling and ensure a uniform holding pressure until the curing or setting of the binder component has gone beyond the recovery stage.

In utilising a caterpillar press to effect the essential squeezing zone treatment a problem arises in that the platens of one track in turning into the rectilinear path parallel to the platens of the other track are liable to impress irregularities or transverse marks upon the material under treatment. The problem is twofold: firstly, the leading edge of the platens in turning is liable to dig into the metal band and cause local

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transverse overcompression or a mark to be impressed on the material, and secondly, the metal band is liable to take a permanent set. The reactive pressure of the material in the squeezing zone flattens the band against the faces of adjacent angularly disposed platens and the bending at the facing angle is liable to strain the metal of the band beyond its elastic limit.

The invention is directed to the solution of this problem by adopting a positioning of the rollers of the upper chain (assuming it to be the chain which turns into the rectilinear path in the said squeezing zone) with their axes over the junctions between the platens and providing a running rail or bed form for the rollers at the squeezing zone which constrains the platens in turning into the rectilinear path to travel on an arc or curvature of such radius that the flexure of the band as it is flattened in the squeezing zone against the angularly disposed faces is well within the elastic limit, and further that the gap between the platens in making said turn is such that on the one hand, the band in the locality assumes a convex curve which is within the critical capacity of recovery to bending of the metal, and on the other, is capable of supporting the reactive pressure of the material. To encompass this latter feature it is essential according to the invention to arrange the linkage of the platens so as to provide a gap between adjacent platen edges when in the rectilinear position such that the band lies across it with insignificant concave deflection, while at the critical turning point in the squeezing zone, the gap widens to allow a free bowing of the band about a radius well within the elastic limit of the metal. The existence of the gap between platen edges, in the rectilinear run also accommodates heat expansion and debris which, if collected between platen edges, would set up undue strain under the pressure. The gapping may be provided by amply radiusing the platen edges with a clearance in rear which is merely sufficient to accommodate debris and allow for expansion.

The invention also comprises a composite roller platen link band or chain having a series of transverse sets of links each link of which bears a roller at each end, the sets being connected together by intermediate sets of plain links alternating transversely with the rollered links to which they are pivotally coupled, and platen plate members for each set of rollered and plain links extending transversely from side to side of the composite chain and disposed to afford a small gap between the leading edge of each platen and the trailing edge of the next, with the width of the gap determined according to the gauge of the metal band, and the characteristics thereof such that under pressure the concave deflection of the band at the gap does not exceed a few thousandths of an inch when the platens are in the rectilinear path, the relative arrangement of the roller and link pivotal axes and the gaps being such that the central planes of the gaps substantially contain the said axes.

The above form of chain is employed for that chain (preferably the upper one) the platens of which turn into the rectilinear path in the said squeezing zone, while the other chain may have the same characteristics, but since its platens can assume the rectilinear path before entering the squeezing zone the precautions referred to above are not so important. The platens of this other (lower) chain are conveniently provided at their outward ends with upstanding flanges to provide, when the chain is running in the rectilinear path, continuous deckle edges within which the metal bands and the platens in the pressure lap of the first-mentioned chain are housed.

According to one arrangement of the backing or running beds for the platen chain rollers the lower bed is mounted as a fixture and the upper bed and chain is mounted for vertical displacement, and this arrangement will be assumed for the purpose of further description and exemplification of the invention.

According to the invention a backing or running bed for the upper chain is floatably mounted for vertical displacement and equalised pressure is brought to bear throughout the pressure lap hydraulically to effect such displacement.

In one form the bed comprises a series of massive transverse beams carrying a set of inverted rails corresponding with and acting as running tracks for the link rollers suspended from the pistons of hydraulic cylinders in hydraulic communication one with another and connected to a common pressure source.

The bed for the lower lap may be of similar massive transverse beam and rail construction and it is preferred that the beds should operate in opposed relation by mounting the beams between the jaws of massive vertical brackets located at the sides of the pressure lap so that such brackets under pressure function in tension.

The machine according to the invention may be built to operate on a prepared mat of material fed on the lower band to the pressure lap, according to one or other, or alternatively either, of the modes hereunder:

1. Producing products by maintaining a constant pressure on the mat in the machine and providing for products of different final gauge by varying the thickness of the mat presented for pressure.

2. Operating upon mats of constant thickness and providing for pressures of selectable value whereby products of different thickness and density result.

3. Combining the adjustments available under 1 and 2 above.

The invention will be further described hereunder with respect to a machine for manufacturing wall boarding in continuous wall form from a layer or mat of a mixture of sawdust or the like and a proportion of a thermosetting binder such as phenol formaldehyde or urea formaldehyde, which has been subjected prior to its entry into the machine to a heat treatment, preferably by radio frequency electric field.

In the accompanying drawings:

Figure 1 is a side elevation of a machine for carrying out the present invention.

Figure 2 is a plan view of the machine shown in Figure 1.

Figure 3 is to the right of the centre line an end elevation of the same machine viewed from the left of Figure 1 and with the caterpillar chains and metal bands removed, and to the left of the centre line a sectional elevation on the line 3—3 of Figure 1.

Figure 4 is a side elevation partly in section showing in more detail the feed end of the machine and the mat of board-forming material passing into the squeezing zone.

Figure 5 is a fragmentary isometric view of the link construction of the platen chain with the rollers removed.

Figure 6 is a plan view of a length of the platen chain showing the link arrangement.

Figure 7 is a detail side elevation of the pressure rail arrangement and transverse supporting beams.

Figure 8 is a plan view of the arrangement shown in Figure 7, and

Figure 9 is an end elevation of the arrangement shown in Figure 7 giving a side elevation of one of the transverse supporting beams.

In carrying the invention into effect as described by way of example, a suitable foundation is provided on which are mounted two sets of massive brackets **1**, a set being located at each side of the machine. These brackets each have an inwardly projecting foot **2** and an inwardly overhanging head **3**, the sets being positioned in pairs facing one another. The upper ends of the pairs of brackets are tied across by transverse girders **4**.

Extending between and supported upon the foot portions of each pair of brackets **1** is a massive beam (or beams) **5** for supporting a bed **6** over which runs the active or pressure lap of the lower of two endless chains A and B of pressure applying platens **19** and **20**.

Similar but inverted beam members **7** are provided for the upper bed or abutment **8** for the platens of the pressure lap of the upper endless chain A of platens **19**. These upper beams **7** are mounted for displacement under the pressing operation towards the lower bed and are suitably guided at their outer end in vertical slideway members **9** which may conveniently be mounted on the inner sides of the brackets **1**. The beams **7** are slung from or acted upon towards each end by the pistons **10** of hydraulic cylinders **11** carried at the underside of the bracket heads **3**. In the machine illustrated (see especially Figures 7 and 8), the beams **7** are connected in pairs by bridge members **70**, the hydraulic cylinder pistons **10** being applied centrally of the bridge members; thus eight beam members are served by four hydraulic cylinders **11** on each side corresponding with each set of brackets **1** (see Figure 2).

Upon or in each of the lower and upper sets of beams **5** and **7** the pressure beds **6** and **8** are formed by massive longitudinal rails **12** and **13**, such being adopted for the beds as the most suitable form of construction for co-operation with stout running or anti-friction rollers **14** with which the platen chains A and B are provided as described hereafter.

The rails **12** and **13** may be provided with hardened wear faces **71** and **72** with which the rollers **14** have contact. The board-forming material E is treated between lower and upper endless metal bands D and F which pass between the active horizontal and parallel laps of the lower and upper platen chains A and B.

At each end of the machine, turning point chain wheel members or assemblies 15 are mounted on transverse shafts 16 running in suitable bearings 17 carried in supports 18 from the machine foundation, the shafts 16, bearing 17 and supports 18 being shown only on the left of Figure 2. The longitudinal distance between the axes of the chain wheel members 15 for the upper chain A may be somewhat less than that for the chain wheel members for the lower chain B as it is convenient to arrange the lower chain B protruding beyond the ends of the upper chain A, especially at the feed end of the machine, in order that the platens 19 of the lower chain will assume their horizontal rectilinear run position before entering the squeezing zone between the platens.

For a machine for making wide wall boarding (for example, 4 ft. wide) the platens 19 are carried by a composite link chain to overcome certain difficulties in manufacture.

These composite link chains each comprise a series of transverse sets of rollered links 21 and a corresponding series of transverse sets of plain or unrollered links 22. The sets of plain links 22 are located longitudinally between the sets of rollered links 21 and both sets are pivotally connected together at their adjacent ends by pivot pins or spindles 23 to constitute a hinged link chain with the plain links intervening, transversely of the chain, between each pair of rollered links. The pins or spindles 23 do not extend across the whole width of the platen chain, but only across three widths of links as shown as a group in Figure 5; in this way any transverse flexure of the platen chains does not cause binding between the pins or spindles 23 and their associated links 21 and 22.

The rollered links 21 each comprise a link body 24 (see Figure 5), towards the ends of which leg members 25 project toward the interior of the endless laps of the chain. On these leg members 25 bearings 26 are formed for the trunnions or spindles 27 of the stout rollers 14 (see Figures 4 and 6). Thus the rollers 14 are mounted in the transverse intervals between the rollered links 21 afforded by the intervening plain links 22, one trunnion of each roller being supported in half the bearing in the leg of one link and the other trunnion in half the bearing in the leg of the next laterally adjacent link so that each bearing 26 accommodates the two trunnions of adjacent rollers. The axes of the rollers 14 and the axes of the link pivots 23 lie substantially in the transverse plane at the junction between the links. The body portion 24 on its inward side of each of the rollered links 21 has a sprocket recess 28 for driving engagement by sprocket teeth 29 of the chain wheel assemblies 15.

The chain wheel assemblies 15 each comprise a series of sprocket toothed discs 30 spaced on their shaft 16 in planes aligned with the longitudinal planes of the sets of rollered links 21.

Each set of links 21 and 22 has transversely extending (from side to side of the pressure bed) the platen plates 19 of heavy gauge welded or otherwise secured to and transversely bridging the links so that each set of rollered and plain links becomes an integral unit with its platen plate 19. A heat insulating layer may be interposed between the platens and the links of the chain in order to increase the life of the chain bearings. The width (i. e. the dimension taken longitudinally of the machine) of the platen plates 19, more particularly those of the upper chain A, should be made as short as constructionally convenient in order to conform to the radius of curved path (as referred to above and described hereinafter) required in the squeezing zone (see Figure 4). The ends of the platens 19 of the lower chain B are upturned in side flanges 31 which when mated on the straight run form upstanding continuous deckle edges for laterally confining the material E under pressure and housing the metal bands D and F. This squeezing zone extends from the adjacent end of the rectilinear horizontal path of the upper chain A to a point where the upper surface of the mat E of material for treatment comes under pressure applying contact with the upper metal band F and the angle subtended by this zone will vary with the thickness of the mat fed in. As shown in Figure 4, the squeezing zone extends from point X to point Z.

The edges of adjacent platen plates of the upper chain A when in their rectilinear pressure path do not meet, a gap 32 being left between their edges at the face. If the edges met so that the platens prescribed a continuous surface in the said rectilinear path, then the gap which of necessity is opened when the platens are travelling in the curved path, would be sufficiently small to cause danger of the metal band being bent on the angularly disposed platens as over a definite edge angle, as the reactive pressure of the material under treatment forces the adjacent portions of the band against the said angularly disposed platen faces.

Hitherto it has been considered necessary to avoid gaps between platens when on the straight runs of the chains in order to preserve a continuous pressure surface. It has, however, been found that by providing a small gap between platen facing edges in the straight runs, a sufficiently large gap is furnished at the curved path in the squeezing zone to enable the band in bending to bow in a curve of large enough radius to avoid approaching the elastic limit of the metal of the band and imposing a permanent set in the band, the said bow constituting an arched bridge across the said gap such as to sustain the imposed pressure.

The width of the small gap is also governed by the permissible width when the band is lying (as a beam) across such gap in the rectilinear path. If the gap is too wide under pressure there would be a concave deflection of the band into the gap which would cause a discernible convex mark on the material. Therefore, in choosing the gap it must be limited to one which would not permit a concave deflection of more than, say, of the order of a few thousandths of an inch. Naturally the width of the permissible gap will vary according to the thickness and resistance to deflection of the metal band.

Each gap may be a throughway gap with radiussed outer edges as shown at 33 in Figures 4 and 5, or by providing a sufficient radius the required gap effect may be attained without its penetrating throughout the thickness of the platen plates.

No gaps (as viewed in the straight run) between platen plates for the lower chain need be provided, since the platens of the lower chain enter the squeezing zone already in the rectilinear path and the problem does not arise; nevertheless, it is preferable to provide for gaps **34** (Figure 4) since they also avoid any expansion difficulties under heat, accommodate fragments of debris, and enable the same link construction to be used for both the upper and lower chains.

The active or pressure lap of the lower chain B is supported and guided in the horizontal path by the chain rollers **14** running on the lower set of rails **12**. The idle or return lap of the lower chain is conveniently supported by the provision of a series of fixed axis rollers **35** mounted below said lap (Figures 1 and 3).

The idle lap of the upper chain A is supported on light rails **36** positioned below said lap and on to which the rollers of the links run as the upper chain links emerge from one chain wheel assembly and pass towards the other chain wheel assembly. In order that the rollers **14** of the chain links do not fall away or become displaced when unsupported or when the links are canted or inverted a pair of retaining pins **37** are provided across the open end of each bearing **26** and are accommodated in holes **38** provided therein (see Figures 4 and 5).

The upper chain A is mounted and proportioned such that its lower lap sags from its chain wheel assemblies **15** and this sagging portion at the feed end of the machine is constrained to travel through the squeezing zone X—Z in a path of predetermined curvature.

This curved path is preferably provided by extending the forward horizontal portion **39** of the said upper (abutment) rails **13** into a smooth curve of large radius (or radii) and this curved part may continue toward the vertical axial plane of the adjacent chain wheel assembly.

The path of the platens **19** of the upper chain A with their rollers **14** running on the curved rail portion **39** guides the upper metal band F through the squeezing zone X—Z, in such a manner that transverse lines of unequal pressure are avoided and the band is not subjected to stresses which would impart a permanent set. This effect is brought about by co-ordinating the radius of the curved squeezing path with the gaps provided between platens having regard to the thickness or gauge of the metal band, the characteristic to bending of the metal and the pressure to be sustained. For example, with a tempered carbon steel band of thickness of .024 inch employed in a machine developing a pressure of the order of 300 lbs. per sq. inch, the curved squeezing zone path for platen 12 inches in width should have a radius not less than approximately 6 feet and the small gaps (taken in the straight run of the platens) should be about ⅛ of an inch across the adjacent end edges of the platens and about ¼ inch including the radiussed edges of the faces of the platens, opening to a maximum in the squeezing zone of about ⅜ of an inch. Both the upper and lower metal bands may be the same but it will be appreciated that as the lower band is operating under different conditions it may be of different metal and gauge, for instance it may be of stainless steel and of any suitable gauge.

Both metal bands are supported on rotary guide drums (as shown in the case of the upper band F on drums **40**) appropriately positioned to lead the band between the upper and lower platens, the lower band being laid upon the lower platens as they assume their rectilinear horizontal run. It is convenient to arrange for the lower band D to be extended on the feed side to a mat laying or spreading station including a preheating zone where the material is treated to radio frequency heating currents. Also the lower band D may extend beyond the output end of the machine to deliver the formed board for further processing, cutting up and distribution. Thus as in the machine illustrated the guide drums for the lower band D are not shown.

The upper band F is led under the sag of the platens of the upper chain A to contact therewith in front of the maximum squeezing zone angle of the machine (see point Y in Figure 4). The traction effect of the chains upon the respective bands is sufficient to traverse the band along the bed at the same rate as that of the chains without independent driving means.

The hydraulic cylinders **11** for bringing the operating pressure to bear upon the material through bed rails **13**, platens **19** and metal band F, are hydraulically coupled together into a system and to a suitable source of hydraulic pressure in such a manner that the pressure effected by the hydraulic pistons is uniformly distributed throughout the pressure beds. Adjustable limit or stop means are provided for the hydraulic displacement accurately to determine the gauge to which the material is reduced under the applied pressure. The hydraulic system and the adjustable limit or stop means used in conjunction therewith are not illustrated and may be of any convenient known character, the design of which forms no part of the present invention, the essential being that a positive stop is provided to limit the downward movement of the pressure beds so that the board is accurately gauged to the predetermined thickness required.

Any suitable means for maintaining a heat treatment of the material concurrently with the pressure treatment between the pressure beds may be provided. According to one mole the platens or chain links may be electrically heated by resistance elements located or enclosed in the platens.

Alternatively the heating may be done by radiant heaters situated close to the platen faces on the return laps. For this purpose the return laps of the metal bands may be supported in spaced relation to the return laps of the platen chains so that suitable heaters may be located in proximity to the platen faces on their return laps, to provide the necessary heating. The means for maintaining or providing heat treatment of the material under pressure is also not illustrated in the accompanying drawings, since these means may be of any suitable known character and do not form part of the present invention.

After passing through the squeezing zone X—Z determining the gauge and consolidation of the material the parallel horizontal run of the platen chains maintains the pressure during the major or that part of the curing period of the thermo-setting binder component of the mixture where there is any substantial tendency to recovery or reactive swelling of the material. Hence, the pressure bed **13** should extend for ten feet or such other length as required according to the curing period of the material and its properties of recovery and the rate of travel of the platens.

At the delivery end of the machine the upper platen chain A may be guided as by the portions **41** of the rails **13** (Figure 1) to the adjacent chain wheel assembly in a curved path similar to that of the squeezing zone, but in this case the only precaution necessary is to arrange that the platens do not change direction so abruptly as to cause their edges harmfully to scrape the band in turning.

As previously mentioned the path of the lower steel band is continued and the band is suitably supported horizontally during any residual period for curing and to deliver the material as required; for example the band may pass the continuous wall boarding to saw means for cutting the board into suitable lengths in known manner.

The upper metal band is raised from the material at the delivery end of the upper chain and passes around the guide drum 40 (or drums) on a return path to the feed end of the machine.

The metal bands D and F may act directly on the material or through a paper, textile or other layer of material or foil. For example, a continuous paper or other layer may be laid by any known means under the mat of material and between it and the lower band. According to one convenient mode the mat of material is spread upon a paper or other web of the same width as the finished boarding at the laying or feeding station, whence it passes supported upon the extension of the lower metal band to the pressure applying platen chains, receiving on the way at a suitable point a superimposed web of paper or the like. Thus the board as delivered comprises a core of consolidated board forming material sandwiched between preformed layers of covering or finishing material integrally united to the core material. The means for providing such surface layer are not illustrated in the accompanying drawings and do not form a part of the present invention, suitable means are, however, well known in the art.

The density of the board is controlled by the pressure adjustment on the hydraulic mechanism as well as being dependent on the type and particle size of the moulding material, chiefly wood waste. The thickness is controlled by the same factors, and in addition, by the volume or weight of moulding material which is delivered by the feeding device. It is preferred to keep the pressure at some constant value greater than 200 lbs. per square inch, and approximately to adjust the thickness by the volume of moulding material delivered by the feeding device. The final thickness is imposed and gauged accurately by the control of the previously mentioned adjustable limit or stop means on the hydraulic mechanism, which may come into action towards the end of the squeezing zone.

Although the improved machine is primarily intended for the purpose of treating a particular mass whether initially in dry powder form or fed as a semisolid or plastic consistency, the machine may be used as a press with or without heat, for the lamination of sheet material, such as plywood, or other multiple sheets or webs including fabrics, felted material or thin metal or metallic sheets or webs.

I claim:

1. In a caterpillar press of the type in which material under treatment is pressed between metal bands backed by upper and lower endless chains of platens turning around chain wheels and led into rectilinear and parallel paths and backed by rectilinear bed means, where the material, until set, is maintained under pressure to prevent recovery or reactive swelling after having been brought to final gauge and consolidation during a relatively short longitudinal travel through a squeezing zone located in advance of the rectilinear path zone, the squeezing zone ex-

tending from the point at which the upper band first makes contact with the material to the point at which the upper band enters its rectilinear path, the improvement including a long radius curved guide member for the upper platen chain and located to engage said chain throughout the extent of the squeezing zone, pivotal connecting means for the chain links, roller means associated with the chain and engageable against said bed means in the rectilinear path and against said guide member in the squeezing zone, the pivotal axis of each of said connecting means and the axis of each roller means being disposed with respect to the gap between each platen and the next such that the central plane of each gap substantially contains said axes, said gap being such that when the platens are in their rectilinear path it is wider than may be required to accommodate heat expansion and is bridgeable by the said upper band without appreciable deflection, and the curvature of said guide member and said width of said gap being so chosen that when the platens are traversing said guide member, each gap opens to a degree permitting the band, between the portions thereof which are pressed flat against the adjacent platens by the reaction of the material in the squeezing zone, to bend within the elastic limit of the metal and form an arched bridge spanning said gap and capable of supporting said pressure, whereby the material when compressed in the squeezing zone or in the rectilinear lap receives no mark appreciable to the eye in the region of said gap.

2. In a caterpillar press of the type in which material under treatment is pressed between metal bands backed by upper and lower endless chains of platens turning around chain wheels and led into rectilinear and parallel paths and backed by rectilinear bed means, where the material, until set, is maintained under pressure to prevent recovery or reactive swelling after having been brought to final gauge and consolidation during a relatively short longitudinal travel through a squeezing zone located in advance of the rectilinear path zone, the squeezing zone extending from the point at which the upper band first makes contact with the material to the point at which the upper band enters its rectilinear path, the improvement including a long radius curved guide member for the upper platen chain and located to engage said chain throughout the extent of the squeezing zone, transverse sets of chain links pivoted together to form the endless chains, pivotal connecting means for connecting the chain links transversely in said sets and for connecting said sets to form said chains, roller means carried at each end of each alternate link around the chain and engageable against said bed means in the rectilinear path and against said guide member in the squeezing zone, the pivotal axis of each of said connecting means and the axis of each roller means being disposed with respect to the gap between each platen and the next such that the central plane of each gap substantially contains said axes, said gap being such that when the platens are in their rectilinear path it is wider than may be required to accommodate heat expansion and is bridgeable by the said upper band without appreciable deflection, and the curvature of said guide member and said width of said gap being so chosen that when the platens are traversing said guide member, each gap opens to a degree permitting the band,

between the portions thereof which are pressed flat against the adjacent platens by the reaction of the material in the squeezing zone, to bend within the elastic limit of the metal and form an arched bridge spanning said gap and capable of supporting said pressure, whereby the material when compressed in the squeezing zone or in the rectilinear lap receives no mark appreciable to the eye in the region of said gap.

3. In a caterpillar press of the type in which material under treatment is pressed between metal bands backed by upper and lower endless chains of platens turning around chain wheels and led into rectilinear and parallel paths and backed by rectilinear bed means, where the material, until set, is maintained under pressure to prevent recovery or reactive swelling after having been brought to final gauge and consolidation during a relatively short longitudinal travel through a squeezing zone located in advance of the rectilinear path zone, the squeezing zone extending from the point at which the upper band first makes contact with the material to the point at which the upper band enters its rectilinear path, the improvement including a long radius curved guide member for the upper platen chain and located to engage said chain throughout the extent of the squeezing zone, transverse sets of chain links pivoted together to form the endless chains, pivotal connecting means for connecting the chain links transversely in said sets and for connecting said sets to form said chains, roller means carried at each end of each alternate link around the chain and engageable against said bed means in the rectilinear path and against said guide member in the squeezing zone, the pivotal axis of each of said connecting means and the axis of each roller means being disposed with respect to the gap between each platen and the next such that the central plane of each gap substantially contains said axes, said gap being such that when the platens are in their rectilinear path it is wider than may be required to accommodate heat expansion and is bridgeable by the said upper band without appreciable deflection, and the curvature of said guide member, said width of said gap and the distance of the pivotal axis of the connecting means from the operative faces of the platens being so chosen that when the platens are traversing said guide member, each gap opens to a degree permitting the band, between the portions thereof which are pressed flat against the adjacent platens by the reaction of the material in the squeezing zone, to bend within the elastic limit of the metal and form an arched bridge spanning said gap and capable of supporting said pressure, whereby the material when compressed in the squeezing zone or in the rectilinear lap receives no mark appreciable to the eye in the region of said gap.

4. In a caterpillar press for continuously applying heat and pressure to a material to be treated upper and lower endless chains turning around chain wheels, said chains comprising transverse sets of pivotally connected links, platens carried by each of said transverse sets of links, pivotal connecting means between each link of each set and between each transverse set of links, roller means carried at each end of each alternate link, rectilinear rails located in alignment with said roller means adapted to back and apply pressure to said chain through said roller means, means for applying pressure to the rails backing one of said endless chains, limit means influencing said pressure means to prevent said one endless chain being moved under said pressure beyond a predetermined distance towards the other chain to gauge the material under treatment, long radius curved guide means formed as a continuation of said rectilinear rails and backing said upper chain to constrain the platens of said upper chain to approach the platens of said lower chain along a curved path, and endless metal bands operatively associated with the platens located to be interposed between the platens and the material under treatment both when the platens are backed by the rectilinear rails and when the platens are in said curved path, the pivotal connecting means between the chain links and the axis of each roller means being arranged to lie on the central longitudinal plane of the gap between the edge of each platen and the next, said platens being dimensioned to give to said gap a width when the platen faces are in rectilinear alignment greater than that required for the accommodation of heat expansion of said platens and said chain links, the dimension of said gap being further regulated with respect to the radius of said curved guide means such that when the platens are angularly disposed in said curved path each gap opens to a degree to allow said metal band to form an arched bridge over said gap which will support the reactive pressure thereon of the material under treatment.

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