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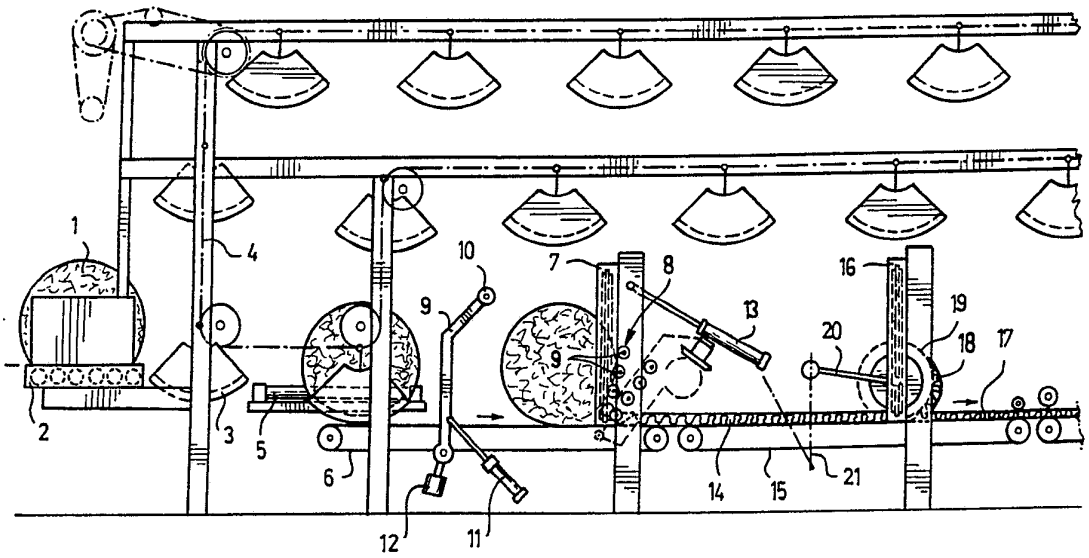
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Published
With international search report.

(54) Title: AN APPARATUS FOR THE FORMATION OF AN INSULATING MATERIAL PLY



(57) Abstract

The invention relates to an apparatus for the formation of an insulating material ply, e.g. in the manufacture of insulating chutes. The object is to provide a continuous insulating material ply (17) of a predetermined thickness. A primary ply (14) of surplus thickness is first sawn out of an insulating material roll (1) by rotating the insulating wool roll against the edge of a band saw, and this primary ply (14) is fed to another ply-cutting saw (16) which saws the primary ply into the final ply (17) with the predetermined thickness. The surplus from the primary ply (14) is collected on a drum (19) provided in connection with the ply-cutting saw (16) to form an intermediate storage. When the insulating material roll (1) runs out, the sawing of the final ply (17) is continued from the intermediate storage without interruption until the leading edge of a new opened insulating material roll (1) reaches the ply-cutting saw (16).

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An apparatus for the formation of an insulating material ply

In the manufacture of insulating chutes, for instance, a ply with a desired thickness has generally been sawn out of insulation wool wound into a roll, and the ply has then been fed into a machine in which it has been shaped and cured into an insulating chute. The sawing may be carried out by rotating the wool roll against the edge of a band saw.

A drawback has been that the process is interrupted when one roll of wool runs out and is replaced with another. In addition to disturbances caused by the interruption as such, disturbances occur also for the reason that the end portions of an old and a new roll will not get the same evenness as the rest of the ply in the sawing. The result from all this is that quite a great number of insulating chutes of inferior quality are formed due to the interruption.

It is also known to open a roll of wool manually and feed a wool layer of a relatively high thickness into a band saw, the surplus being collected on to an intermediate storage roll from which the sawing is continued when the roll of wool opened manually runs out. A new roll of wool is opened and fed into the band saw after the intermediate storage roll has suitably decreased. In this way a continuous insulating material ply can be obtained; the technique, however, is laborious and requires great watchfulness from the worker.

The object is now to provide a new apparatus for the formation of a continuous insulating material ply in a simple way and automatically.

The object is achieved by means of an apparatus defined in claim 1. Preferred embodiments are de-

fined in more detail in claims 2 to 7.

In the following the invention will be described with reference to the attached schematical drawing.

Figure 1 is a side view of the whole apparatus.

Figure 2 is an enlarged view of the most important parts of the apparatus.

A roll 1 of insulating wool is positioned on a transporter 2 which transports one roll at a time into a cradle 3 moving with an endless transporter 4. The transporter 4 may be a chain conveyor comprising a number of cradles.

When the cradle 3 with the roll reaches a working cylinder 5, the cylinder tilts the cradle, in the drawing clockwise, so that the roll 1 rolls on to a transporter 6, being stopped by a roller assembly 8 which is provided at a band saw 7 and in which individual rollers 9 rotate actively.

Thereafter a working cylinder 11 is caused to retract from the position shown in the drawing, whereby an arm 9 is lowered towards the roll 1 under the influence of its own weight, being pressed against the roll through a roller 10 which, similarly to the rollers 9, rotates actively. The compression pressure of the roller 10 can be adjusted by means of a counter weight 12. The roller assembly 8 is positioned in the left-hand side position shown in the drawing.

The roll 1 is rotated for some time by means of the roller assembly 8 and the roller 10 until the roll 1 is sufficiently round to be sawn by means of the band saw 7. On coming to the transporter 6, the roll 1 may therefore be rather "deformed"; no core is needed.

When the roll 1 is sufficiently round, the roller assembly 8 is passed into the right-hand side position shown in the drawing by means of a working

cylinder 13, whereby the roller 10 presses the roll 1 within the reach of the edge of the band saw, and while the roller assembly 8 and the roller 10 keep rotating the roll, in the drawing anticlockwise, the band saw 7 saws a primary ply 14 out of the roll 1. The primary ply is passed from the transporter 6 on to a transporter 15 and further therealong to another band saw 16 which splits the primary ply 14 into a secondary ply 17 which goes on into a chute manufacturing means to be wound and cured therein. A surplus 18 from the primary ply is collected in a manner known per se e.g. onto a drum 19 formed by a round section, and after the end portion of the primary ply has passed through the band saw 16, the sawing of the secondary ply 17 is continued directly from the intermediate storage.

By means of articulated arms 20, 21, the intermediate storage drum 19 can be displaced away from the band saw for cleaning.

Claims:

1. An apparatus for the formation of an insulating material ply, comprising a ply-cutting saw, preferably a band saw (16), for sawing a ply (17) of a predetermined thickness, and means for passing the sawn ply into further treatment, c h a r a c t e r i z e d in that a presawing station is provided before the ply-cutting saw (16) for sawing a primary ply (14) of surplus thickness out of an insulating material roll (1) and for feeding it to the ply-cutting saw (16), and that a drum (19) known per se is provided in connection with the ply-cutting saw for collecting the surplus (18) from the primary ply (14) to form an intermediate storage, for producing a continuous ply (17) having a predetermined thickness.

2. An apparatus according to claim 1, c h a r a c t e r i z e d in that the presawing station comprises means (6, 8, 10) for rounding the insulating material roll (1) by rotating before presawing.

3. An apparatus according to claim 2, c h a r a c t e r i z e d in that said means for rounding the roll (1) comprise a transporter (6), a press roll (10) acting on the roll (1) above the mid plane thereof, and a stopping roller assembly (8) which is arranged to keep the roll (1) out of contact with the presaw (7) during the rounding step and to yield after the rounding has been completed so that the roll (1) is passed to the presawing.

4. An apparatus according to claim 3, c h a r a c t e r i z e d in that the press roller (10) and individual rollers (9) in the stopping roller assembly (8) are arranged to rotate actively.

5. An apparatus according to claim 3, c h a r a c t e r i z e d in that the presaw is a band saw (7).

6. An apparatus according to claim 1, c h a r a c t e r i z e d in that a feed storage of insulating material rolls (1) formed by an endless transporter (4) is provided before the presawing station.

7. An apparatus according to claim 6, c h a r a c t e r i z e d in that the transporter is a chain conveyor (4) on which cradles (3) are mounted in bearings for supporting the rolls (1).

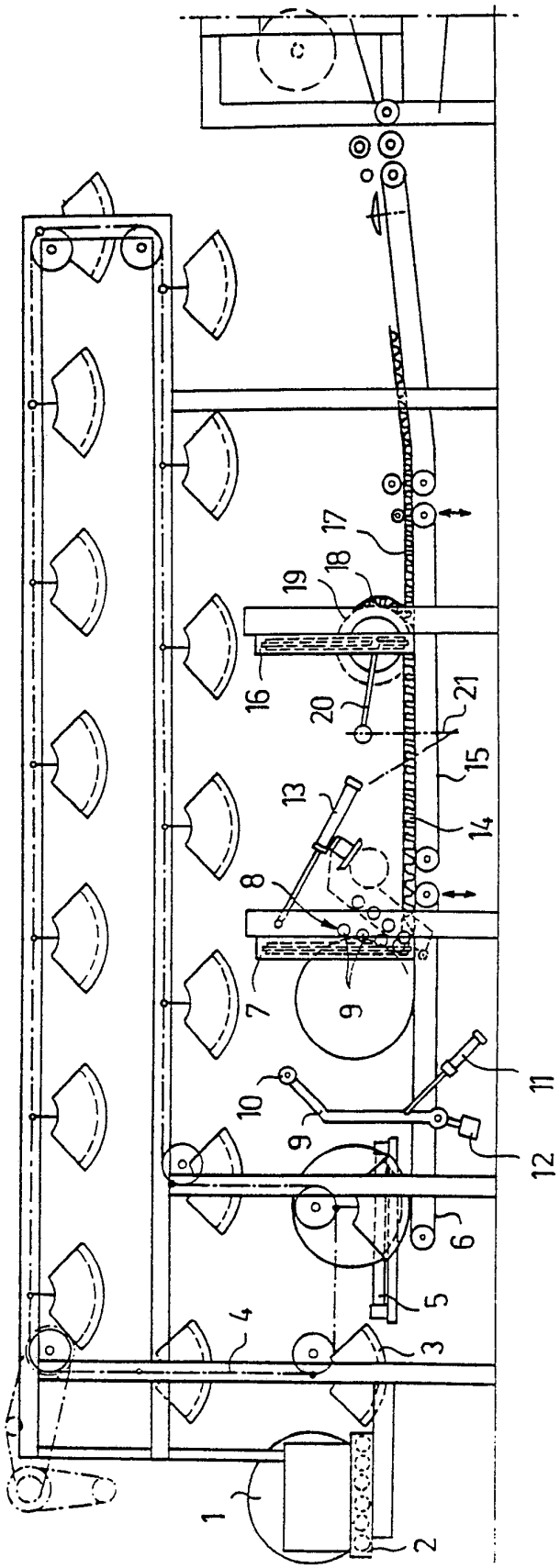


FIG. 1

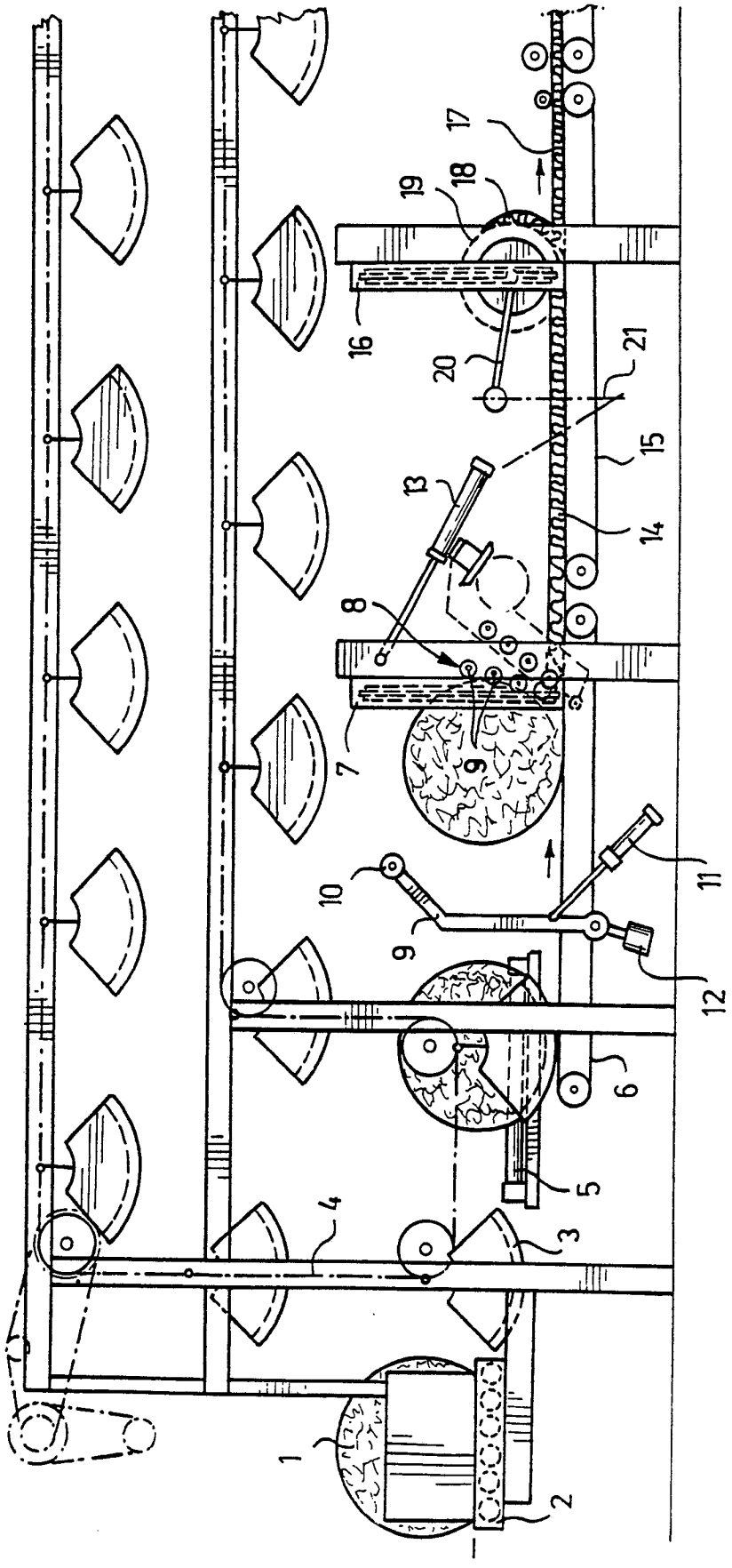


FIG. 2

INTERNATIONAL SEARCH REPORT

International Application No PCT/FI89/00011

I. CLASSIFICATION OF SUBJECT MATTER (if several classification symbols apply, indicate all) [6]

According to International Patent Classification (IPC) or to both National Classification and IPC 4

F 16 L 59/00

II. FIELDS SEARCHED

Minimum Documentation Searched [7]

Classification System	Classification Symbols
IPC 4	F 16 L 59/00, /02, /04, /14
IPC 3	C 04 B 43 /02

.../...

Documentation Searched other than Minimum Documentation to the Extent that such Documents are included in the Fields Searched [8]

SE, NO, DK, FI classes as above.

III. DOCUMENTS CONSIDERED TO BE RELEVANT [9]

Category *	Citation of Document, [11] with indication, where appropriate, of the relevant passages [12]	Relevant to Claim No. [13]
Y	GB, A, 1 214 330 (BALDWIN-EHRET-HILL, INC.) 2 December 1970 See page 3, lines 68-97 and figures 5-7 & NL, 6802893 FR, 1556684 BE, 711901 DE, 1696019 SE, 402632 SE, 356570	1
Y	DE, A, 1 471 352 (OWENS-CORNING FIBERGLAS CORP.) 23 October 1969 See page 11, line 18 - page 12, line 3 and page 12, lines 15-23 & NL, 6900220 LU, 40325	1

* Special categories of cited documents: [10]

"A" document defining the general state of the art which is not considered to be of particular relevance

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"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.

"&" document member of the same patent family

IV. CERTIFICATION

Date of the Actual Completion of the International Search	Date of Mailing of this International Search Report
1989-05-10	1989 -05- 17
International Searching Authority	**Signature of Authorized Officer**
Swedish Patent Office	Erik Svensson

FURTHER INFORMATION CONTINUED FROM THE SECOND SHEET

II Fields searched (cont)

US Cl 138:103,118,145,146,149

V. ☐ OBSERVATIONS WHERE CERTAIN CLAIMS WERE FOUND UNSEARCHABLE [1]

This international search report has not been established in respect of certain claims under Article 17(2) (a) for the following reasons:

1. ☐ Claim numbers....., because they relate to subject matter not required to be searched by this Authority, namely:

2. ☐ Claim numbers....., because they relate to parts of the international application that do not comply with the prescribed requirements to such an extent that no meaningful international search can be carried out, specifically:

3. ☐ Claim numbers....., because they are dependent claims and are not drafted in accordance with the second and third sentences of PCT Rule 6.4(a).

VI. ☐ OBSERVATIONS WHERE UNITY OF INVENTION IS LACKING [2]

This International Searching Authority found multiple inventions in this international application as follows:

1. ☐ As all required additional search fees were timely paid by the applicant, this international search report covers all searchable claims of the international application.

2. ☐ As only some of the required additional search fees were timely paid by the applicant, this international search report covers only those claims of the international application for which fees were paid, specifically claims:

3. ☐ No required additional search fees were timely paid by the applicant. Consequently, this international search report is restricted to the invention first mentioned in the claims; it is covered by claim numbers:

4. ☐ As all searchable claims could be searched without effort justifying an additional fee, the International Searching Authority did not invite payment of any additional fee.

Remark on Protest

☐ The additional search fees were accompanied by applicant's protest.

☐ No protest accompanied the payment of additional search fees.