

78828/87

COMMONWEALTH of AUSTRALIA

PATENTS ACT 1952

APPLICATION FOR A STANDARD PATENT

594506

K
We

THOMAS JOSEF HEIMBACH GmbH & CO., of

An Gut Nazareth 73,
D-5160 Düren,
FEDERAL REPUBLIC OF GERMANY

APPLICATION ACCEPTED AND AMENDMENTS

ALLOWED2-1-90.....

hereby apply for the grant of a Standard Patent for an invention entitled:

"A MACHINE FELT, AND A METHOD FOR MANUFACTURING SAME"

which is described in the accompanying ~~provisional~~
complete specification.

Details of basic application(s):—

NumberConvention CountryDate

P 36 32 386.1

Federal Republic of Germany 24th September 1986

LODGED AT SUB-OFFICE

23 SEP 1987

Melbourne

The address for service is care of DAVIES & COLLISON, Patent Attorneys, of 1 Little Collins Street, Melbourne, in the State of Victoria, Commonwealth of Australia.

Dated this 22nd

day of September

19 87

To: THE COMMISSIONER OF PATENTS

H. M. Rimington(a member of the firm of DAVIES &
COLLISON for and on behalf of the Applicant).

Davies & Collison, Melbourne and Canberra.

COMMONWEALTH OF AUSTRALIA

PATENTS ACT 1952

DECLARATION IN SUPPORT OF CONVENTION OR
NON-CONVENTION APPLICATION FOR A PATENT

Insert title of invention

In support of the Application made for a patent for an invention
entitled: "A MACHINE FELT, AND A METHOD FOR MANUFACTURING
SAME"

Insert full name(s) and address(es)
of declarant(s) being the appli-
cant(s) or person(s) authorized to
sign on behalf of an applicant
company.

XX
We Dr. Otto Bartman and K. H. Muller,

of Thomas Josef Heimbach GmbH & Co.
of An Gut Nazareth 73, D-5160 Duren,
FEDERAL REPUBLIC OF GERMANY
do solemnly and sincerely declare as follows :-

Cross out whichever of paragraphs
1(a) or 1(b) does not apply

1(a) relates to application made
by individual(s)
1(b) relates to application made
by company; insert name of
applicant company.

1. ~~XXXXXX~~ I am ~~XXXXXX~~
We are ~~XXXXXX~~

or (b) I am authorized by

Thomas Josef Heimbach GmbH & Co.

Cross out whichever of paragraphs
2(a) or 2(b) does not apply

2(a) relates to application made
by inventor(s)
2(b) relates to application made
by company(s) or person(s) who
are not inventor(s); insert full
name(s) and address(es) of inven-
tor(s).

the applicant..... for the patent to make this declaration on ~~XXXX~~ its behalf.

2. ~~XXXXXX~~ I am ~~XXXXXX~~
We are ~~XXXXXX~~

or (b)

1. Vera Hälker geb. Rogge
Rathhausstr. 16c
5162 Niederzier
2. Helmut Hälker
Rathhausstr. 16c
5162 Niederzier

LODGED AT SUB-OFFICE
21 DEC 1987
Melbourne

~~XXXX~~ are ~~XXXX~~ the actual inventor(s)..... of the invention and the facts upon which the applicant.....
is entitled to make the application are as follows :-

State manner in which applicant(s)
derive title from inventor(s)

The inventors are employees of the

applicant whereby the applicant would if a
patent were granted on an application made
by the said inventors be entitled to have

Cross out paragraphs 3 and 4
for non-convention applications.
For convention applications,
insert basic country(s) followed
by date(s) and basic applicant(s).

3. The basic application..... as defined by Section 141 of the Act, was made
in Fed. Rep. of Germany on the Sept. 24, 1986
by Thomas Josef Heimbach GmbH & Co.
in on the
by
in on the
by

4. The basic application..... referred to in paragraph 3 of this Declaration was
the first application..... made in a Convention country in respect of the invention the subject
of the application.

Insert place and date of signature.

Declared at Düren this 4 th day of August, 1987

Signature of declarant(s) (no
attestation required)

Note: Initial all alterations.

Thomas Josef Heimbach GmbH & Co.
[Signature]

(12) PATENT ABRIDGMENT (11) Document No. AU-B-78828/87
(19) AUSTRALIAN PATENT OFFICE (10) Acceptance No. 594506

- (54) Title
A MACHINE FELT, AND A METHOD FOR MANUFACTURING SAME
- International Patent Classification(s)
(51)⁴ D21F 007/08
- (21) Application No. : 78828/87 (22) Application Date : 22.09.87
- (30) Priority Data
- (31) Number (32) Date (33) Country
3632386 24.09.86 DE FEDERAL REPUBLIC OF GERMANY
- (43) Publication Date : 31.03.88
- (44) Publication Date of Accepted Application : 08.03.90
- (71) Applicant(s)
THOMAS JOSEF HEIMBACH G.M.B.H. & CO.
- (72) Inventor(s)
VERA HALKER; HELMUT HALKER
- (74) Attorney or Agent
DAVIES & COLLISON, MELBOURNE
- (57) Claim

1. A machine felt suitable for use in a paper making machine, the machine felt comprising at least one band of flexible support member which includes two opposed edge sections adapted to be releasably secured together by coupling elements so as to form an endless belt, said at least one of said bands comprising a length of material comprising two end regions each having a free edge and an intermediate region between said end regions, said two end regions being folded over said intermediate regions so that the band comprises two or more plies which extend substantially the entire length of the machine felt, and at least one fibre web secured to the support member so as to hold the plies together.

13. A method for manufacturing a machine felt according to any one of claims 1 through 11 wherein a support member comprising at least one band of material is superposed into at least two plies, whereupon a fiber web is deposited and is pinned together the plies wherein end regions of the band of material are folded back and are moved together by their free edges at least to the same level and in that before or after the folding back procedure coupling elements are

(11) AU-B-78828/87
(10) 594506

-2-

fastened in the vicinity of the folding edges and in that thereupon the coupling elements are connected together while forming a seam before the fiber web is deposited and pinned.

COMMONWEALTH OF AUSTRALIA

PATENT ACT 1952

COMPLETE SPECIFICATION

(ORIGINAL)

FOR OFFICE USE

594506

CLASS

INT. CLASS

Application Number:
Lodged:

Complete Specification Lodged:
Accepted:
Published:

Priority:

Related Art:

This document contains the
amendments made under
Section 49 and is correct for
printing.

NAME OF APPLICANT: THOMAS JOSEF HEIMBACH GmbH & CO.

ADDRESS OF APPLICANT: An Gut Nazareth 73, D-5160 Duren,
Federal Republic of Germany

NAME(S) OF INVENTOR(S) Vera HALKER, Helmut HALKER

ADDRESS FOR SERVICE: DAVIES & COLLISON, Patent Attorneys
1 Little Collins Street, Melbourne, 3000.

COMPLETE SPECIFICATION FOR THE INVENTION ENTITLED:

"A MACHINE FELT, AND A METHOD FOR MANUFACTURING SAME"

The following statement is a full description of this invention,
including the best method of performing it known to us :-

1 "A MACHINE FELT, AND A METHOD FOR MANUFACTURING SAME"

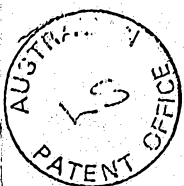
2
3 The invention concerns a machine felt.

4 Machine felts have the most diverse applications. A
5 main field of application is in papermaking machines.
6 Therein they are used in particular in the press stage.
7 Ordinarily they consist of a support material which most of
8 all absorbs the tensions exerted on the machine felt,
9 further of a fiber web pinned on the support material and
10 assuring a smooth and soft surface and a specific water
11 permeability. Frequently the support material is designed
12 to be of several plies. If, as is the case most often, the
13 support material consist of a fabric, several planes of
14 filling threads bound together by warp threads, or several
15 plies of completed belts of fabric coupled by binding
16 threads, can be used to build several plies.

17 Various solutions are known to join the tip edges of
18 the machine felts. One solution is to make the entire
19 machine felt oversize, whereby short projections exist at
20 both end segments, which then are bent around on the back
21 side of the machine felt (European patent application 0099
22 836). A number of filling treads have been removed in the
23 zone of the fold-over edge, whereby loops consisting of warp
24 treads are formed. The loops of both tip edges are then
25 made to overlap and a slip-in wire can be passed through
26 them. However special connecting means such as spirals or
27 the like, may be provided, that then are inserted into the
28 warp loops.

29 This kind of connection suffers from the drawback that
30 in the seam zone, the machine felt is twice as thick as
31 elsewhere, and thereby substantial vibrations are incurred.
32 Such a connection moreover is unsuitable for a support
33 material made of knits.

34 The German Offenlegungsschrift 24 36 293 describes
35 papermaking machine felts with a warp knit structure as the
36 support material. The warp knit is provided with a pinned
37 or needled fiber web whereby a felt like surface is produced
38 on both sides.



1 The connection of the ends of the felt band of the
2 papermaking machine presents problems because the structure
3 of the warp knit offers only a slight grip at its ends to
4 the coupling elements for instance in the form of spirals,
5 even when the support material is in several plies.
6 Suggestions already have been advanced in the German
7 Gebrauchsmuster 85 10 220.2, one alternative being that the
8 support material consist of a double ply, spirally/wound
9 belt of material. Thereby the impact between the ends of a
10 belt or length of material will be widely accommodated,
11 namely by changing the position of the belt of material
12 inside out and vice versa. Advantageously the direct
13 connection between the ends of the belt of material can then
14 be eliminated.

15 However this manufacturing advantage in turn entails
16 drawbacks when mounting the felt into the papermaking
17 machine because the machine felt cannot be opened. Moreover
18 the ply ends cause strong vibrations.

19 Accordingly it is the object of this invention to so
20 design a machine felt with several plies of the kind stated
21 initially that on one hand vibrations will be averted in the
22 machine even at high operational speeds, while on the other
23 and this felt can be opened for installation and lastly
24 allows using also knitted support material.

25 According to the present invention there is provided a
26 machine felt suitable for use in a paper making machine, the
27 machine felt comprising at least one band of flexible
28 support member which includes two opposed edge sections
29 adapted to be releasably secured together by coupling
30 elements so as to form an endless belt, said at least one of
31 said bands comprising a length of material comprising two
32 end regions each having a free edge and an intermediate
33 region between said end regions, said two end regions being
34 folded over said intermediate regions so that the band
35 comprises two or more plies which extend substantially the
36 entire length of the machine felt, and at least one fibre
37 web secured to the support member so as to hold the plies
38 together.



~~(g) the folded-back edge or at least one of the~~
~~folded-back edges can be connected together on each tip side~~
~~of the machine felt.~~

In the invention therefore the plies of the support material are formed in that both end segments of the belt of material made in excess length are folded back to such an extent on the central zone that at least two plies are formed. The folding edges then are so far from the folded back tip edges of the belt material that coupling elements can be fastened to the folding edges, even when illustratively the particular belt of material is not woven but instead consists of a warp-knit. In this manner a finite machine felt is achieved, of which the tip edges consisting of the folding edges are joined by the connecting elements or, -- if the connection is opened following the pinning of the fiber web -- are linkable. In the latter case the machine felt can be placed in its open condition into the machine and must be closed only then. This design furthermore eliminates machine vibrations. Furthermore the machine felt of the invention is characterized by improved tensile strength.

As a rule it is enough that the individual plies are formed by folding over the end segments of a single belt of material. However it is possible also to form the support material from two or even more superposed belts of material each with folded-back end segments. These belts of material can be merely superposed or they may nestle into one another, the first alternative offering the advantage that the plies of the outer belt of material is made of a finer weave or knit than the inner belt of material in order to avoid markings.

In a further embodiment of the invention, the folded-back end segments of the belt of material are mutually opposite by their tip edges and, for reasons of symmetry, in such a manner that they are located at the center of the machine felt, whereby the folded-back end segments therefore are of the same length. The tip edges of the folded-back end segments may



extend precisely transversely to the direction of advance of the machine felt. Preferably however the tip edges shall be at a slant to the transverse direction of the machine felt, in particular if the machine felt is being used in the pressing stage of a papermaking machine. As a result any vibrations or impacts still present in the press shall be avoided.

A three-ply support material is obtained when the folded-back end segments of the belt of material overlap over the entire length of the machine felt. If the support material is formed of more than one belt of material, then upon a corresponding combination of these belts, support materials with four, five and six plies can be manufactured.

Appropriately the end segments of the belt of material are folded back toward the same side even where it is possible to fold over the end segments once to one side and next to the other.

Suitable connecting elements in particular are spirals inserted into the support material which upon the joining of the machine felt are made to engage in such a manner that a slip-in wire can be inserted into both simultaneously which shall couple the two spirals. Polyamide was found especially suitable for the spirals. A non-run warp-knit was found especially suitable for the machine felt of the invention.

In order that the folded-back end segments stay in their positions when the fiber web is being pinned, the tip edges of the end segments shall be temporarily fastened to the adjacent ply and/or to each other.

A method for manufacturing the machine felt of the invention is characterized in that both end segments of the belt of material are folded back and are guided by means of their tip edges at least to the same height and that before or after the folding-over operation coupling elements are

fastened in the zone of the folding edges and in that thereupon the coupling elements are joined while forming a seam before the fiber web is deposited and pinned. In case the machine felt must be introduced into the machine in the open condition, the fiber web following pinning shall be slit open on one side of the seam at the top and at the bottom sides to be lifted off the seam zone, whereupon the seam shall be opened again.

This method is characterized by simplicity and furthermore by the fact that by pinning the fiber web in the manner described, the seam also shall be covered softly even though subsequently the seam can be opened and closed again. The lifted part of the fiber web then will come to rest again in operation over the seam, the direction of advance always to be so selected that the slit is located behind the seam.

To carry out the method of the invention, the tip edges of the end segments shall be provisorily fastened in place. Also, the spirals used as coupling elements shall be inserted during the manufacture of the support material: this is possible in simple manner in particular where knits are concerned.

The invention further provides that the tip edges of the end segments are controlled to be overlapping up to the folding edges to achieve a triple-ply design of the belt of material.

Lastly the invention proposes that a warp-knit be used for the support material, where the end segments of this warp-knit are so folded back that the cross-threads of one ply shall be offset from and facing the gaps of the cross-threads of the other ply. This offers the advantage that upon compressing the machine felt, the cross-threads shall positively mesh into each other and shall in this manner reinforce one another so that the plies shall not move relative to each other.

The invention is shown in further detail in the drawing in relation to illustrative embodiments.

Fig. 1 is a sideview of a support material for a machine felt, and

Fig. 2 is the sideview of a papermaking machine felt with the support material of Fig. 1.

The support material 1 shown in Fig. 1 consists of a single belt of material 2. The belt of material 2 is about twice as long as the finished papermaking machine felt shown in Fig. 2. By folding back the two end segments 3,4 in such a way that they come to rest on the central zone 5 and hence on the lower ply, a further and upper ply 6 is formed with mutually opposite tip edges 7,8. Spirals are inserted into the belt of material 2 at the folding edges 9,10 and across their entire lengths: this is carried out already during the manufacturing process.

A three-ply variation of the support material 1 is shown by the dashed extensions 13 14: if the belt of material 2 is made in a length which is triple that of the papermaking machine felt, the end segments 3,4 will then completely overlap with the then present extensions 13, 14, one end segment 3 coming to rest on the outside and one end segment 4 on the inside.

During the further processing into a papermaking machine felt, the support material 1 is closed into an endless belt by the two spirals 11, 12 -- which match their thickness to that of the support material 1 -- so meshing together that a slip-in wire can pass through them as a connection wire. Thereupon a fiber web is pinned on and through the outside of the support material 1. This pining or needling then produces the papermaking machine felt 15 shown in Fig. 2, the size of the fiber web 16 being shown -- even though exaggerated relative to the length and width of the papermaking machine felt 15 -- by the boundary lines 17, 18.

In order to release the connection of the folding lines 9,10 the slip-in wire 23 is removed and the fiber web 16 is provided with slits 20, 21 above and below the spirals 11, 12.

Thereupon the papermaking machine felt 15 may be inserted into a papermaking machine and after the ends equipped with the spirals 11, 12 are joined, can be couple^d again by inserting the slip-in wire 23.

Thereupon the loose ends of the fiber web 16 will lie flat over the seam 19.

The reference numerals in the following claims do not in any way limit the scope of the respective claims.

THE CLAIMS DEFINING THE INVENTION ARE AS FOLLOWS:

1. A machine felt suitable for use in a paper making machine, the machine felt comprising at least one band of flexible support member which includes two opposed edge sections adapted to be releasably secured together by coupling elements so as to form an endless belt, said at least one of said bands comprising a length of material comprising two end regions each having a free edge and an intermediate region between said end regions, said two end regions being folded over said intermediate regions so that the band comprises two or more plies which extend substantially the entire length of the machine felt, and at least one fibre web secured to the support member so as to hold the plies together.

2. Machine felt according to claim 1 comprising two or more of said bands superposed on one another.

3. Machine ^{felt}~~belt~~ according to claim 1 or claim 2 comprising two said bands superposed on one another, and when the support member forms the endless belt, the outer band being of a finer material than the inner band.

4. Machine felt according to any preceding claim wherein said free edges of said end regions are disposed adjacent one another when said end regions are folded over said intermediate region.

5. Machine felt according to any preceding claim wherein said end regions are substantially the same length.

6. Machine felt according to any preceding claim wherein said free edges are inclined relative to the transverse direction of the machine felt.

7. Machine felt according to any one of claims 1 to 3 wherein said end regions are of such a length that they

890725, ARSSPE.020, &filename/o&



overlap one another over the entire length of the intermediate region.

8. Machine felt according to any preceding claim wherein said end regions of the band are folded back toward the same side of the intermediate region.

9. Machine felt according to any preceding claim wherein the coupling elements are in the form of spirals which are inserted into the support member.

10. Machine felt according to claim 9 wherein the spirals are made of polyamide.

11. Machine felt according to any preceding claim wherein the support member is formed of a non-run warp knit.

12. Machine felt according to any preceding claim wherein the free edges are temporarily fastened to the adjacent ply and/or to each other.

13. A method for manufacturing a machine felt according to any one of claims 1 through 11 wherein a support member comprising at least one band of material is superposed into at least two plies, whereupon a fiber web is deposited and is pinned together ^{with} the plies wherein end regions of the band of material are folded back and are moved together by their free edges at least to the same level and in that before or after the folding back procedure coupling elements are fastened in the vicinity of the folding edges and in that thereupon the coupling elements are connected together while forming a seam before the fiber web is deposited and pinned.

14. Method according to claim 13 wherein following the pinning procedure the fiber web is slit on one side of the seam at the top and at the lower side and is lifted off in the region of the seam and in that the seam is then reopened.



15. Method according to claim 13 or claim 14 wherein the free edges of the end regions are temporarily fastened.

16. Method according to any one of claims 13 to 15 wherein the coupling elements are ^{in the form of} ~~inserted as spirals into the~~ ^{secured to} ~~coupling elements during manufacture of~~ the support member.

17. A method according to any one of claims 13 to 16 wherein the free edges of the end regions are guided in overlapping manner as far as the edge sections of the band.

18. A method according to any one of claims 13 to 17 wherein a warp knit is used for the support member the end regions of said warp knit being folded back in such a manner that the cross threads of one ply are offset relative to and opposite the gaps of the cross threads of the other ply.

19. A machine felt substantially as hereinbefore described with reference to the accompanying drawings.

20. A method of manufacturing a machine felt substantially as hereinbefore described with reference to the accompanying drawings.

Dated this 26th day of July, 1989.

DAVIES & COLLISON

Patent Attorneys for

THOMAS JOSEF HEIMBACH GmbH & CO.



890725, ARSSPE.020, &filename/o&

Fig. 1

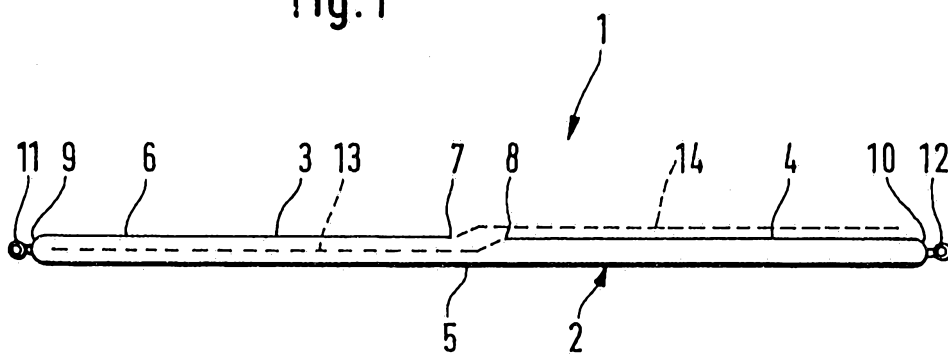


Fig. 2

