(19) Europäisches Patentamt
European Patent Office
Office européen des brevets

(11) Publication number: **0 367 614**
**A2**

# (12) EUROPEAN PATENT APPLICATION

(21) Application number: **89311379.5**

(51) Int. Cl.5: **D21F 1/00**

(22) Date of filing: **02.11.89**

(30) Priority: **04.11.88 GB 8825870**

(43) *Date of publication of application:*
**09.05.90 Bulletin 90/19**

(84) Designated Contracting States:
**AT BE DE FR GB IT NL SE**

(71) Applicant: **SCAPA GROUP PLC**
**Oakfield House 52 Preston New Road**
**Blackburn Lancashire BB2 6AH(GB)**

(72) Inventor: **Jourdes, Joseph Jean Pierre**
**Le Lindois**
**F-16310 Moutemboeuf(FR)**
Inventor: **Rouhling, Jean**
**Vouthon**
**F-16220 Montbron(FR)**

(74) Representative: **Funge, Harry et al**
**M'CAW & CO. 41-51 Royal Exchange Cross Street**
**Manchester M2 7BD(GB)**

## (54) Jointing of fabric ends.

(57) A method of jointing the ends of a papermakers or like industrial fabric, typically a corrugator belt, is proposed wherein the ends (12, 13) of a multilayer fabric, of which adjacent layers (17, 18, 24) are joined by binder yarns, are cut back into complementary stepped configuration, the step being in a plane between two successive fabric layers (17, 18) and a clipper seam (14) is provided between the fabric layers of the respective opposing fabric ends existing below the level of the step, the fabric being slitted (at 21) beyond the line of the clipper seam and into the body of the fabric to provide a tongue (19) to receive clipper seam hooks.

EP 0 367 614 A2

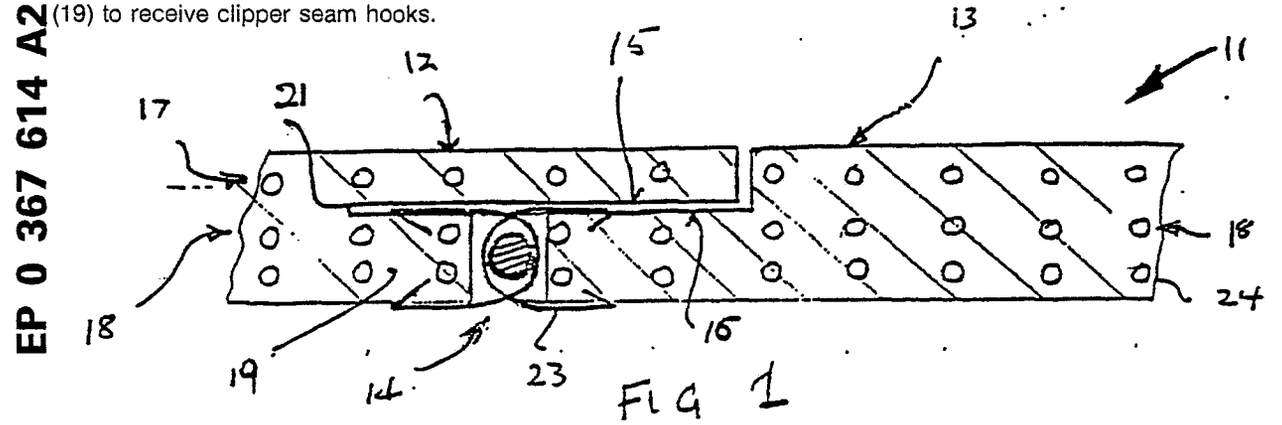


Fig 1

# JOINTING OF FABRIC ENDS

The invention concerns papermakers and like fabrics, and has particular, though not exclusive reference to corrugator belts. Corrugator belts comprise heavy, multi-layer fabrics which are flat woven and hence require that the ends be joined to produce an endless belt for application to the papermachine. A typical belt would have a weight of, say, 4kg/sq. metre.

Traditionally the belts are of substantial thickness, and difficulty has been experienced in satisfactorily bringing the belt into endless form. In particular, jointing usually involves the use of a clipper seam the hooks of which encompass the full fabric thickness, and the seam itself defines a break in the support surface of the belt of significant proportions.

The object of the present invention is to provide an improved form of jointing.

According to the invention there is proposed a flat woven papermakers or like industrial fabric comprising plural layers of interwoven warp and weft yarns and additional yarns extending in either or both of the warp and weft directions and interconnecting adjacent said layers, the fabric further including cooperable jointing means at the respective fabric ends, the jointing means including a clipper seam engaged with and connecting some only of the said plural layers and a butt join overlying said clipper seam and in offset disposition relative thereto.

According to a preferred feature, the respective fabric ends of a complementarily stepped configuration in correspondence with a space between successive fabric layers and the fabric is slitted beyond the line of the clipper seam parallel to the plane of the fabric and into the body of the fabric.

The invention also includes the method of joining, by means of a clipper seam, the ends of a papermakers or like industrial fabric comprising plural layers of interwoven warp and weft yarns and additional yarns interconnecting adjacent such layers, the method comprising the steps of forming the respective fabric ends into complementarily-shaped stepped configuration by cutting, including cutting in a plane parallel to a face of the fabric, along a line intermediate two adjacent fabric layers, the cut parallel to the fabric face being extended into the fabric at one fabric end to define a tongue for arrangement in opposed disposition relative to a corresponding part of the other fabric end, and providing a clipper seam between the tongue and the said corresponding part of the other fabric end.

The invention will now be described further, by way of example only, with reference to the accompanying drawings illustrating several embodiments thereof and in which:-

Fig. 1 is a diagrammatic illustration of a connection between fabric ends produced in accordance with the invention and

Figs. 2 to 4 illustrate typical weave structures of application to the context of corrugator belts and susceptible to the application of the invention.

Referring now to the drawings, and particularly to Fig. 1 thereof, a corrugator belt comprises a flat woven multi-layer structure 11, in which the respective ends 12, 13 only are shown, the structure being made endless by means of a clipper seam 14 engaged with some only of the layers.

In forming the joins between the fabric ends, the respective ends 12, 13 are cut to complementary stepped form, those cuts 15, 16 at the respective fabric ends 12, 13 which extend parallel to the general plane of the fabric being on a line between two adjacent fabric layers 17, 18 and thus severing only yarns which connect the adjacent layers without prejudice to the integrity of the individual layers. Cut 15 at fabric end 12 is extended into the fabric as at 21, the clipper seam 14 being applied between the tongue 19 formed by the extension 21 to the cut 15 and the corresponding part 22 of the opposed fabric end 13.

Prior to shaping, the fabric ends will be treated with a resin to facilitate the effecting of the cut, whilst glue is applied to those layers of the fabric which receive the clipper seam 14 prior to insertion of the hooks 23 of such seam.

As is apparent from the drawing, the upper layer 17 of fabric end 12 extends across the clipper seam 14 and overlies layers 18, 24 at opposing fabric end 13. A sensibly continuous support surface accordingly exists. in the region of the seam, in contradistinction to the discontinuous surface inherent in the seam region of prior art structures.

The principle illustrated by Fig. 1, namely the formation of complementarily stepped ends, the provision of a clipper seam joining some only of the fabric layers and the utilisation of a further fabric layer to overlie the region of the clipper seam, a tongue being formed to facilitate application of one of the sets of clipper hooks by appropriately slitting the fabric, is of application in the respective contexts of the weave structures shown in Figs. 2 to 4, although other weave structures will, of course, be of application.

In the case of the weave structure shown in Fig. 2, which is a double harness satin, respective ones of face layers 26 and 27 are connected to an intermediate layer 28 by warp binder yarns 29, 31, the individual layers each comprising warp and

weft yarns woven together to provide a coherent structure. The line of cut for the respective fabric ends is as indicated by arrow 32, and it will readily be appreciated that, in forming the cut, only warp binder yarns 29 are severed, the integrity of the layers between which the cut exists being maintained.

Fig. 3 shows an alternative structure wherein plural intermediate layers are provided, severence of what, by analogy, can conveniently be called binder warps 33, 34 at a position between any two adjacent fabric layers 35, 36 leaving a coherent woven structure at either side thereof. In the arrangement illustrated, the cut 37 is made between the second and third of the six layers of weft yarns in the fabric.

A further alternative weave structure is illustated in Fig. 4, four individual fabric layers 41 to 44 being provided, the upper three woven layers 41 to 43 being joined together by binder yarns 45, and the lower three layers 42 to 44 by binder yarns 46. In this instance, the line of cut is between the uppermost layers 41, 42, binder yarns 45 thus being severed, coherence of the upper fabric layer 41 being maintained by the weave structure thereof and the remaining three layers 42 to 44 being held together by binder yarns 46. The plain weave form of the upper layer is thought to be advantageous in forming the tongue to receive the clipper seam hooks.

It is to be appreciated that, whilst in the arrangements illustrated the respective weave structures include binder yarns extending in the warp direction, an analogous effect is attainable if weft binder yarns are used to form the fabric layers.

The invention is of particular application to the context of corrugator belts, that is to say of fabrics having a thickness typically of 0.9 cm, where the gap to receive the clipper seam is, say, 1 cm wide. The belt/fabric will comprise textile materials of the kind commonly used in the art and may comprise, for example, cotton yarns or a polyester mixture.

## Claims

1. A flat woven papermakers or like industrial fabric comprising plural layers of interwoven warp and weft yarns and additional yarns extending in either or both of the warp and weft directions and interconnecting adjacent said layers, the fabric further including cooperable jointing means at the respective fabric ends, the jointing means including a clipper seam engaged with and connecting some only of the said plural layers and a butt join overlying said clipper seam and in offset disposition relative thereto.

2. A flat woven papermakers or like industrial fabric as claimed in claim 1, wherein the said additional yarns interconnecting adjacent fabric layers comprise warp yarns.

3. A flat woven papermakers or like industrial fabric as claimed in claim 1 or 2, wherein the said additional yarns interconnect three adjacent layers.

4. A flat woven papermakers or like industrial fabric as claimed in any one of the preceding claims, wherein the respective fabric ends are of complementarily stepped configuration in correspondence with a space between successive fabric layers and the fabric is slitted beyond the line of the clipper seam parallel to the plane of the fabric and into the body of the fabric.

5. A flat woven papermakers or like industrial fabric as claimed in any one of the preceding claims, wherein the butt join is provided in respect of the surface layer of interwoven warp and weft yarns.

6. A flat woven papermakers or like industrial fabric as claimed in claim 5, wherein the surface layer comprises a plain weave.

7. The method of joining, by means of a clipper seam, the ends of a papermakers or like industrial fabric comprising plural layers of interwoven warp and weft yarns and additional yarns interconnecting adjacent such layers, the method comprising the steps of forming the respective fabric ends into complementarily-shaped stepped configuration by cutting, including cutting in a plane parallel to a face of the fabric, along a line intermediate two adjacent fabric layers, the cut parallel to the fabric face being extended into the fabric at one fabric end to define a tongue for arrangement in opposed disposition relative to a corresponding part of the other fabric end, and providing a clipper seam between the tongue and the said corresponding part of the other fabric end.

8. The method as claimed in claim 7, including the step of resin treating the fabric in the region of the intended seam prior to cutting thereof.

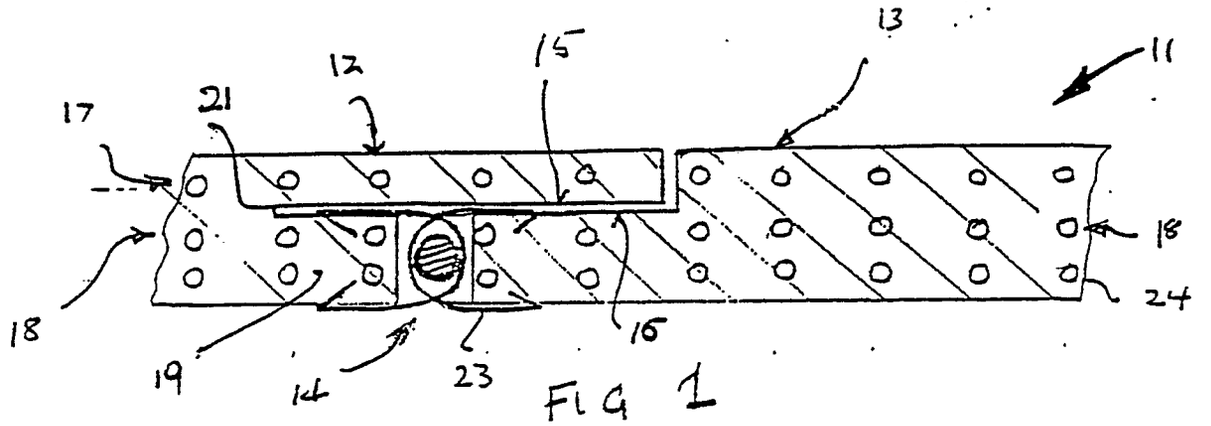


Fig 1

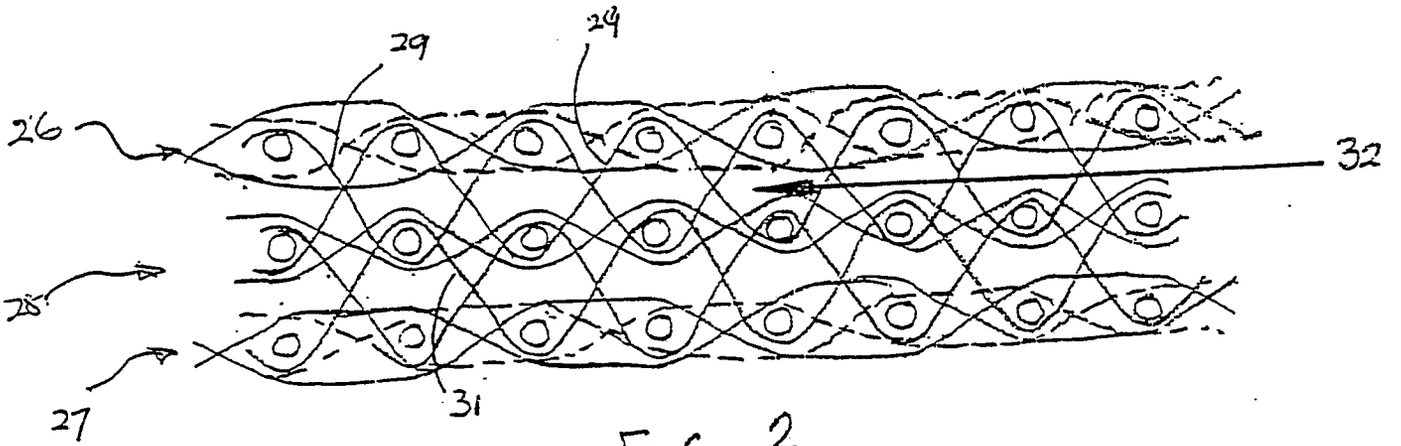


Fig 2

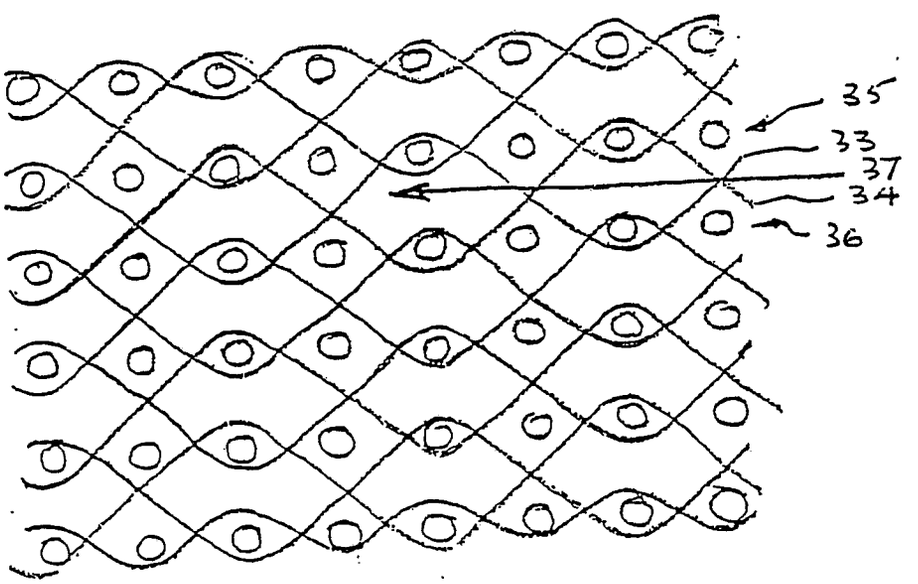


Fig 3

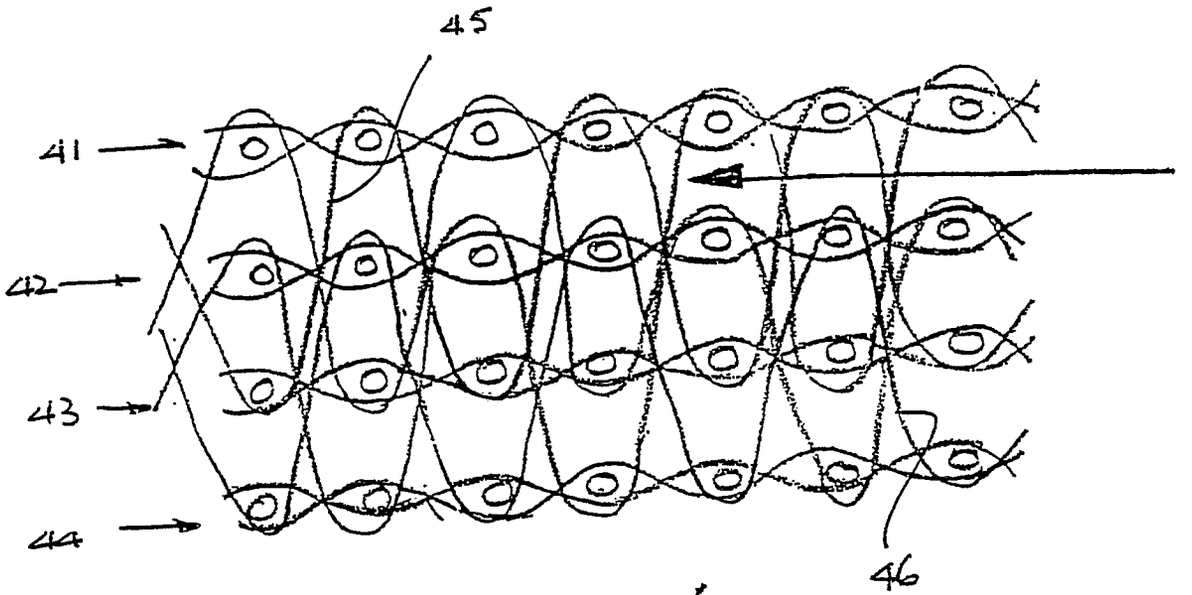


FIG 4.