COMMISSIONER'S DECISION

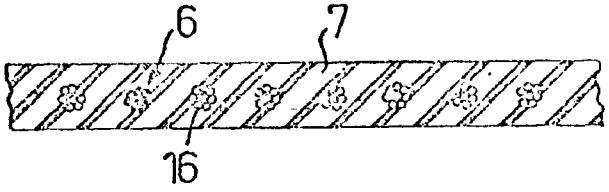
OBVIOUSNESS: Improvements in conveyor belts

The application relates to filament-like reinforcing members embedded in conveyor belts. It was refused for failing to define a patentable advance in the art over the references cited.

Final Action: Affirmed.

This decision deals with a request for review by the Commissioner of Patents of the Examiner's Final Action dated December 4, 1975, on application 165,164 (Class 198-86). The application was filed on February 28, 1973, in the name of Harald Simonsen et al, and is entitled "Improvements In Or Relating To Conveyor Belts."

The application relates to a conveyor belt (7) made of rubber-like plastic material having filament-like reinforcing members (6) embedded therein. The reinforcing members are mutually spaced apart and extend parallel to one another in a longitudinal direction. Figure 2 of this application, shown below, is illustrative of that arrangement.



In the Final Action the examiner refused the application for failing to define patentable subject matter over the following references:

Reference Re-Applied

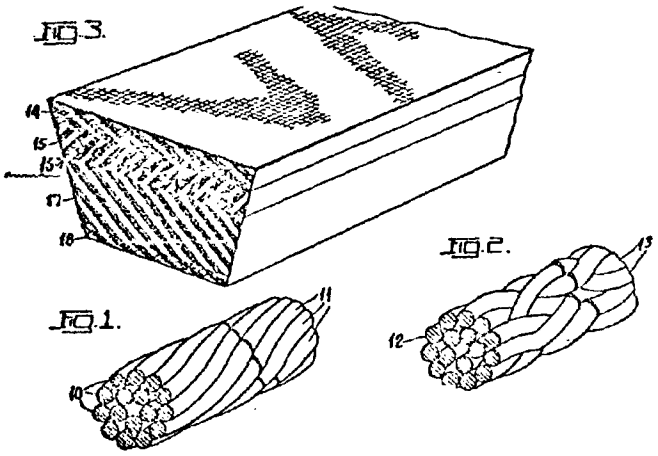
Canadian Patent

468,332 Sept. 26, 1950 Freedlander et al

Reference Applied

Mining Engineer's Handbook, Vol. 1, Third Edition, Robert Peele, Pages 12-20, 12-21, Figures 31(d) and 32(a). Published by John Wiley and Sons, Inc. in September 1963.

Freedlander shows a mechanical belt made of an elastomeric material having filamentary reinforcing members 16 embedded therein. The reinforcing members being arranged substantially parallel and in spaced relationship to each other. Each member consisting of a plurality of steel wires 10 twisted together to form a single strand. Figures 1, 2 and 3 shown below, illustrates that invention:



The Mining Handbook (Peele's) shows that it is old and well-known to form a strand from wires wrapped around a core member having a cross-sectional area larger than the wires forming the remainder of the strand.

In the Final Action the examiner stated (in part):

> In applicant's letter of May 5, 1975 it is argued that Freedlander et al mentions the use of cables in their disclosure, whereas the applicant specifies strands made of twisted wire.
>
> It is acknowledged that the Freedlander et al Patent uses the expression "cables" to describe the reinforcing elements, but a close examination of the disclosure in conjunction with Figure 1 reveals that Freedlander et al's "cable" is in fact a strand in precisely the same sense as applicant's usage of the term "strand", that is, an element formed by twisting a plurality of individual monofilamentary wire.

Clearly the expression "strand" is significant only when describing the structure of a rope or cable comprising a plurality of strands. In the case of applicant's and Freedlander et al's belts the reinforcing elements are the same structurally, and are not intended to be used in the manufacture of ropes or cables. Consequently, it really does not matter whether one chooses to call the reinforcing element a strand or a cable, provided the terms as used in the respective disclosures describe the same structures.

Figure 1 of the Freedlander et al patent shows each "strand" formed from monofilamentary wires in a single twisting operation, as defined in claim 2.

Figure 2 of the Freedlander et al patent shows each "strand" formed from wires in a multiple step twisting operation, as defined in claim 3.

The wires used in Freedlander et al's reinforcing element are circular in cross section and have substantially identical cross sectional areas, as defined in claims 4 and 5.

The "strands" in Freedlander et al's device have a circular cross-section as defined in claim 7.

Figure 3(d) on page 12-20 of Peele's Mining Engineering Handbook, shows that it is old and well-known to form a strand from wires wrapped around a core member having a cross-sectional area larger than the wires forming the remainder of the strand, as defined in claim 7.

Figure 32(a) on page 12-21 of Peele's Mining Engineering Handbook, shows a strand having a cross-sectional area which deviates from the circular form, as defined in claim 8.

In response to the Final Action the applicant argues against the rejection of the application and maintains that the Freedlander patent relates to a power transmission belt as opposed to a conveyor belt. He further argues that the strength members in Freedlander are designated as cables which are built up of multiplicity of fine wires. He also stated (in part):

...

A conveyor belt according to the present invention is characterised primarily in that the strength members are formed of strands of wires united in a single twisting operation. Preferably, the wires are monofile round steel wires, and the strands are selectively composed of wires of uniform cross section, or the strands are made

> of cross sectionally uniform wires which are wound around a core wire which has a greater cross sectional area than the indivdual wires wound around said core wire.
>
> When making a conveyor belt according to the present invention, the manufacturer starts with strands formed of wires rather than with a finished steel cable. The strands are embedded in the elastomeric material of the belt body in much the same manner as steel cables would be secured therein. Thus the strand-reinforced belts are a compromise between fabric and steel cable belts. The strands are less costly to use than a complete steel cable. On the other hand, the strands employed in conveyor belts have the same advantages over high strength fabric belts as do steel cable conveyor belts. For smaller conveyor installations with relatively low pulling forces and secondary impact stresses, the invention makes possible the employment of steel reinforced belts while avoiding the uneconomical over-dimensions of steel cables. The relatively thin strands can be inserted in greater numbers than is the case when finished cables are used so that a greater total surface of the steel cables can be reinforced to ensure improved durability over steel cable belts.
>
> ...
>
> Applicant provides a reinforced conveyor belt which is a definite improvement over fabric-reinforced belts and has, in addition, features and advantages steel cable belts do not have. For example, the present belt is less costly to manufacture, can be made lighter and more durable than conventional cable-reinforced belts. This allows a belt provided with steel strength member where hitherto it was not practical to do so and fabric had to be relied upon for the required strength and other characteristics required by conveyor belts. A simple solution is offered to an outstanding unsolved problem and applicant has met other requirements of invention in addition to economy and overall effectiveness of the conveyor belt. On so doing, applicant believes he is entitled to the patent protection defined by the present claims and therefore allowance of this application is now respectfully requested.

The question before us is whether the application is directed towards a patentable advance in the art. The examiner rejected the claims and the application as a whole. Claim 1 reads as follows:

> A conveyor belt made of rubber or a rubber-like plastics material and having filamentary reinforcing members embedded therein, said members being arranged substantially parallel and in spaced relationship to each other and extending in the longitudinal direction of said belt while being embedded in bonding connection with the material of the belt, said reinforcing members each consisting of a plurality of steel wires twisted together to form a single strand.

The applicant points out that Freedlander is concerned with a power transmission belt whereas the present application refers to a conveyor belt. We observe however, that Freedlander states that his invention "relates to reinforced belts, and particularly to V-belts having a neutral axis section comprising fine metal wires". (emphases added)

The applicant advanced the argument that the strength members in Freedlander are designed as cables which are built up of strands, the strands consisting of a multiplicity of fine wires. We are not persuaded however, that the evidence lays the formal foundation for that argument. Freedlander (Figure 1 supra) shows each "strand" formed from monofilamentary wires in a single twisting operation, while his Figure 2, supra, shows each "strand" formed in a multiple step twisting operation. In our view Freedlander's "cable" is also a strand in precisely the same sense as the applicant's usage of the term "strand," that is, an element formed by twisting a plurality of individual monofilamentary wires. In any event the applicant in response to the Final Action states on page 4, lines 7 f.f., as follows "The belt of the Canadian patent [Freedlander] is a V-shaped driving belt with wire strands closely packed in the neutral zone of the belt." (emphasis added) Freedlander also states that his invention relates to "wire reinforced belts, and particularly to V-belts having a neutral axis section comprising fine metal wires." (emphasis added) Strictly speaking wires are used (in a twisting operation) to make strands, while strands are used (in a twisting operation) to make cables.

The applicant maintains that the strands of the belt, in the instant application, are spaced transversely across the belt. This feature, of course, is a common expedient in the conveyor belt art. He also states that his invention "relates to so-called steel cable belting as compared with conventional belting incorporating a number of plies of fabric." In the same vein Freedlander, while discussing the prior art, states:

"More recently, cables [strands] formed of twisted or braided wire of approximately 0.005" diameter have been used in place of textile cord." In our view they are discussing the same concept. Freedlander goes on to discuss his advance in the art which is an electro treatment for the purpose of depositing a surface coating to the reinforcing strands so that "a substantial degree of adhesion will take place between the plated wire and the rubber composition of which the body of the belt is made.

We turn now to a consideration of the claims. Claim 1 is directed to a conveyor belt with reinforcing members therein, the reinforcing member being bonded to the material of the belt and consisting of a plurality of steel wires twisted together to form a single strand. This, in our view, is substantially what is taught, as discussed above, by Freedlander keeping in mind that he uses the term cable in precisely the sense as the applicant's usage of the term strand. We agree that the claim is restricted to a conveyor belt, but Freedlander invention "relates to a wire reinforced belts...." The concept and the improved result is the same. Claim 1, in our view, is not directed to a patentable advance in the art and should be refused.

Claims 2 and 3, which are dependent on claim 1, are directed to a specific twisting operation which is clearly shown in Figures 1 and 2 of Freedlander.

Claims 4 and 5, which are dependent indirectly on claim 1, relates to features such as the cross-sectional shape of the wires and fail to add a patentable feature to refused claim 1.

The added features of claims 6, 7 and 8, such as the use of the core wire or shape of the strand, are taught by Freedlander and, or Peele's Mining Handbook (cited by the examiner).

In summary, we are satisfied that the claims, and the application as a whole, are not directed to a patentable advance in the art over the references cited by the examiner. There is, in our view, no result which could have flowed from an inventive step. We recommend that the decision in the Final Action to refuse the application be affirmed.

J.F. Hughes
Assistant Chairman
Patent Appeal Board, Canada.

I have studied the prosecution of this application and reviewed the recommendation of the Patent Appeal Board. In the circumstances I have decided to refuse the grant of a patent on this application. The applicant has six months within which to appeal this decision under the provisions of Section 44 of the Patent Act.

J.H.A. Gariépy
Commissioner of Patents

Dated at Hull, Quebec
this 21st day of February, 1977

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