COMMISSIONER'S DECISION

Obviousness: Conveyor Belt Cleaning Device

Applicant claimed a belt-cleaning device in the form of a pulley which comprises a shaft having two auger flights or spirals for cleaning the belt, wound about the shaft and secured thereto. The rejection was reversed because the cited art did not teach what was claimed, nor was the device obvious from that art.

Rejection: Reversed

Patent application 274,857 (Class 198-89), was filed on March 28, 1977 for an invention entitled "Conveyor Belt Cleaning Device." The inventor is James R. Stoddard, assignor to Stoddard (J.) & Sons Limited. The Examiner in charge of the application took a Final Action on February 22, 1979, refusing to allow it to proceed to patent.

The application relates to an endless conveyor system including a pulley arrangement for removing particulate material from the inner face of an endless belt in the conveyor system. The pulley comprises a shaft having two auger flights (spirals) wound about the shaft and secured thereto. More on this system later.

In the Final Action the Examiner refused the application in view of the following patents because, in his view, the claim fails to define patentable subject matter.

United States		
2,886,169	May 12, 1959	Calder
British		
954,741	Apr. 8, 1964	Pates
Canadian		
432,607	Jan. 22, 1946	Bevan

In that action he argued that there is no patentable merit in stipulating that the flights are supported away from the shaft by a plurality of support members. He went on to say that it is held that the mere use of plural auger flights over a single auger arrangement is a matter of design expediency only, and it involves no inventive ingenuity.

In response to the Final Action the Applicant cancelled the claims on file and submitted new claims 1 to 5. In that response he argued that the amended claims are properly allowable and not open to the objections made by the Examiner. He went on to say that the embodiment defined in the amended claims overcomes the problem of "poor cleaning" of the belts used in the cited art. He overcomes this problem by providing more than one spiral flight and by supporting the flights away from the pulley shaft so that there is no trough formed between adjacent turns of the spiral in which material may build up. He went on to say:

The two main claims submitted with this response for consideration, are restricted to a plurality of flights of the same hand and it is believed that the Examiner may well give consideration to these new claims because the invention disclosed and claimed is a considerable practical improvement over the previously proposed arrangement.

Although United States patent 2,886,169 shows the basic concept of the belt cleaning pulley, the new construction now claimed leads to improved performance and it is respectfully submitted that the improvements defined in the new claims of record are not obvious from a reading of British patent 954,741.

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The consideration before the Board is whether or not the application is directed to a patentable advance in the art.

As mentioned, the application relates to an endless conveyor including a pulley arrangement for removing particulate material from the inner face of an endless belt in the conveyor. Figures 1 and 2, below, show that arrangement:



The endless belt is shown at 10, while Figure 2 shows an arrangement which replaced a normal pulley and illustrates a multi-flight embodiment mounted on struts 5. It is the object of the device to provide a special pulley arrangement which presents a leading edge to the belt, and which has an area directed inwardly for driving dislodged particulate material to one end of the pulley and away from the system. More specifically, the special pulley device, for an endless belt conveyor, comprises a shaft having two flights wound spirally about the shaft and secured thereto. The flights include an outwardly directed leading edge 20 for supporting a belt and an inwardly directed surface portion for driving dislodged material towards one end of the pulley. Amended claim 1 reads:

> A pulley for an endless conveyor comprising a rotatable shaft and a plurality of flights of the same hand wound helically about the shaft and starting at different angular positions about the shaft, the flights each being in strip form supported away from the shaft so as to define a substantially unrestricted annular clearance about the shaft, and having a surface portion and a narrower edge portion, the edge portion being outwardly directed for supporting a belt of the conveyor during use and the surface portion projecting inwardly from the edge portion for driving material dislodged from the belt towards an end of the pulley.

The patent to Calder describes and shows a pulley for an endless conveyor comprising a rotatable shaft 2, an auger flight 6 wound helically about the shaft, the flight being in strip form having a surface portion and a narrow edge portion, the edge portion being outwardly directed for supporting a conveyor belt 10. The surface portion projects inwardly from the edge portion for driving material dislodged from the belt towards the ends of the pulley. Figure 1, below, shows that arrangement:





A belt roller comprising, an elongated shaft having spaced portions adapted to be supported to permit rotational movement of said shaft, scroll means secured to said shaft to extend longitudinally thereof between said spaced portions with at least one end thereof being spaced from said portion of said shaft adjacent thereto, means secured to said shaft between said one end of said scroll means and said adjacent portion of said shaft, and said last mentioned means comprising a separate paddle extending outwardly beyond said shaft a greater distance than said scroll means extends to engage dirt accumulations adjacent said one end of said scroll means.

Pates describes and shows a conveyor belt pulley comprising a shaft with helical flights wound about the shaft and supported away from the shaft by a plurality of support members.

The patent to Bevan shows the concept of incorporating plural helical flights in a material conveying auger in plows used for removing snow. On a complete study of the application we find that the combination of the instant device is clearly novel. For example, the Applicant provides more than one spiral flight and by supporting the flights away from the pulley shaft so that there is no trough formed between adjacent turns of the spiral in which material may build up. The only question remaining is whether or not there is ingenuity in the invention. It is clear that the basic concept of a belt cleaning pulley is shown by the Calder patent and the Applicant has recognized this. The Applicant argues that the "improved performance" of his device is a patentable improvement and the claims properly define the scope of monopoly of an invention described in his application.

We have no reason to disagree with the Applicant when he points out that a pulley consisting of more than one spiral at any one point gives the belt much greater peripheral support while moving dislodged material quickly to the sides of the belt. The Calder patent shows the use of left and right hand single spiral blades which are secured directly to the pulley shaft. This, he maintains, tends to allow a build up of material in a "spiral trough-shaped zone defined by adjacent sections of the spiral blade and the shaft." The Applicant also argues that, at any point along the pulley disclosed in Calder, the belt is only supported by one spiral. This is, as opposed to the present arrangement, which provides for more than one spiral flight at any one point and by supporting the flights away from the pulley shaft so that there is no trough formed between adjacent turns of the spiral. The Pates patent works on a different principle in that the greater proportion of the circumferential surface of the pulley is presented by the faces of the strip which confronts the belt whereby particulate material may be trapped between the face of this strip and the belt.

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The Applicant has amended his claims to include the point that the helical flights start at a different angular position about the shaft. While this may roughly be shown by Bevan in use with a snow plow, it is new in the present combination and for a totally different use. Another feature of the claims is that the flights define an unrestricted annular clearance about the shaft. This is not shown by the cited art.

To summarize, it is clear that the combination is novel and we are satisfied that the claims properly define the scope of monopoly of an invention described in the disclosure and illustrated in the drawings. It is our view that the several elements of the claimed combination cooperate to produce a highly desirable improved result which we believe is not obvious from the cited references.

We recommend that the decision in the Final Action to refuse the application be withdrawn.

Hughes

Assistant Chairman Patent Appeal Board, Canada

I have reviewed the prosecution of this application and considered the recommendation of the Patent Appeal Board. I concur with the reasoning and findings of the Board. Accordingly, I withdraw the Final Action and return the application to the Examiner for resumption of prosecution.

J.H.A. Gariepy Commissioner of Patents

Dated at Hull, Quebec this 15th.day of April, 1980

Agent for Applicant

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