COMMISSIONER'S DECISION

Obviousness - Apparatus for Separating Magnetic and Non-Magnetic Materials

The material is carried on a first conveyor towards a magnetic separator which draws the magnetic material and deposits it on a second conveyor. An air blast is also used to clean the magnetic material. The rejection of some of the claims is affirmed, because the cited prior art teaches essentially the same thing.

Final Action: Affirmed.

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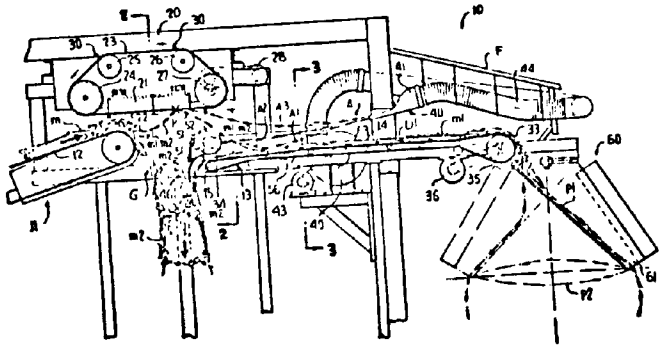
This decision deals with a request for review by the Commissioner of Patents of the Examiner's Final Action dated March 15, 1976, on application 178,489 (Class 209-57). The application was filed on August 9, 1973, in the name of Milbourn L. Smith et al, and is entitled "Counter Air Flow And Magnetic Separation In A Shredded Refuse Classifier." On September 10, 1977, the applicant cancelled a previous request for a Hearing.

The application relates to apparatus for separating magnetic and non-magnetic materials. The material is carried on a first conveyor towards a magnetic separator which draws the magnetic material and deposits it on a second conveyor, while at the same time allowing the non-magnetic material to drop by gravity between the two conveyors. An air blast is also used to remove minor amounts of non-magnetic material from the second conveyor. This material is deposited between the conveyors with the other non-magnetic materials. Figure 1, shown below, clearly depicts that arrangement:

FIG.1

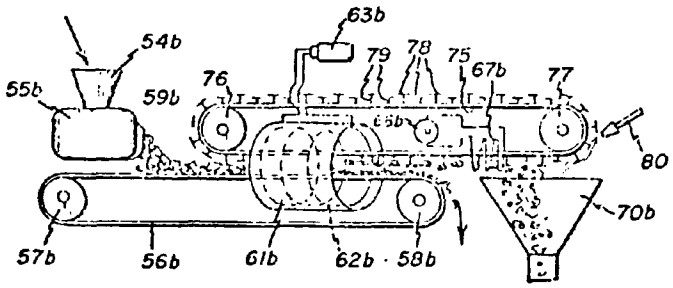


In the Final Action the examiner refused claims 1 to 5, 12, 13 and 26 to 31 for "obviousness in view of the prior art," which is as follows:

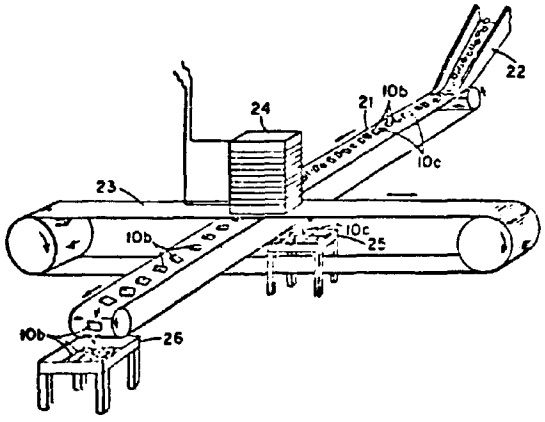
Canadian Patents:

656,031	Jan. 15, 1963	Colburn
651,237	Oct. 30, 1962	Soper

Colburn discloses the use of a magnetic separating means bridging a separation gap between two conveyors with at least an exit and entrance arranged in "in-line" relationship. An air blast is also used to remove minor amounts of non-magnetic material. Figure 6, shown below, is illustrative of that invention:



The Soper patent discloses a means of purifying materials on an endless conveyor by magnetic separating means. This patent was cited to show that separation of material by magnetic means is common knowledge. Figure 5, shown below, illustrates that invention:



In the Final Action the examiner ably presented his position (in part) as follows:

> ...
>
> Claims 1 to 5, 12 and 13 differ from the main reference in that the second conveyor (not necessarily an endless belt) has a conveyor path "inline" with the first conveyor path and in that a means (not necessarily an air blast) for removing non magnetic material (not necessarily pieces of scrap paper) from itself is specified.
>
> These differences, however, are obvious to implement by those skilled in the art. Foreseeably a user of the Colburn device may not have the space available to use a downwardly discharging conveyor. The mere substitution of an endless conveyor (such as conveyor 21 of Soper et al's device) to solve such a space problem is obvious to those skilled in the art. Of course the principle of cleaning by blowing away unwanted debris if not universally obvious, is shown to be known to those skilled in the art by its use in at least two places in the system disclosed by the main reference (air blast means 80 and 95). Although the applicant has taken two steps beyond the Colburn device, these steps are so obvious that one would expect any skilled artisan using this device to take exactly the same steps when faced with space or other problems such as clean product distribution to remote areas.
>
> ...
>
> Claims 1 to 5, 12, 13 and 26 to 31 are refused, then, on the grounds that the differences defined thereby over the main reference are obvious to make by those skilled in the art. The tools, systems or principles representative of these differences are shown to exist in both the main and common knowledge references. The first difference is represented by the existence and varied use of endless conveyors and the second by the showing in Colburn of clean-up type air jets.
>
> ...

In response to the Final Action the applicant amended claim 1 and had this to say (in part):

> ...
>
> The Examiner relies on figure 6 of this patent [Colburn]. Figure 6 teaches a pair of conveyors 56b and 75, and a coil 67b is included in the conveyor 75. The coil is connected to a source of alternating current 68b.
>
> The conveyor 75 includes a plurality of elements 78 which are magnetizable and which collect magnetic particles from the mass of

particles 59b carried by the upperrun of the conveyor 56b. Upon establishment of a demagnetizing field produced by the coil 67b, the particles drop into the hopper 70b under the assist of air directed from a nozzle 80.

It is noted that the upper run of the conveyor 56b is encircled by a cylinder 61b which is connected to a source of energy 63b creating a magnetic field within the area of the coil 62b as described at page 14 lines 23 et seq. of the Canadian patent. Thus, in the Colburn patent, both of the conveyors 56b and 75 include magnetic means which is not the case in the teaching of the present application or in claim 1 which recites specifically that the second conveyor means excludes magnetic means.

In paragraph 1 of page 2 of the Official Action, Examiner states that the funnel 70b is a conveyor. Although applicant does not dispute the fact that 70b can be considered to be such a conveyor, it is noted that the path of the conveyor 56b and the path of the funnel 70b are not in-line as per claim 1 hereof. Further, the two conveyors do not move material in generally the same direction. As can be clearly seen in figure 6, the motion of the material passing through the funnel 70b is at right angles to the motion of the material moved by the conveyor 56b.

The purpose of the nozzle 80 in figure 6 of the patent is quite distinct from the purpose of the means for removing as taught in the present application and defined in claim 1. Thus, the air blown by the nozzle 80 will remove particles from the conveyor 75. The means for removing defined in claim 1 removes the minor amounts of nonmagnetic materials from the second conveyor means.

The issue before the Board is whether or not claims 1 to 5, 12, 13 and 26 to 31 are directed to a patentable advance in the art. Amended claim 1 reads as follows:

> Apparatus for separating magnetically attractive and magnetically nonattractive materials comprising first movable means for conveying said materials along a first path, second movable means for conveying excluding magnetic means contiguous said first conveying means for conveying said materials along a second predetermined path generally in line with said first path, said first and second conveying means move said materials along said respective first and second paths in the generally same direction, magnetic means between said first and second conveying means for removing said magnetically attractive material along with minor amounts of said magnetically nonattractive material from said first conveying means and depositing the same upon said second conveying means, and second means for removing said minor amounts from said second conveying means.

We have considered with care the prosecution of this application and the points and arguments made by the applicant. We find however, that the response to the Final Action is replete with arguments concerning differences over the prior art. We are mindful however, that there must not only be novelty in the combination, but also there must be ingenuity in the invention (vide, Micro Nordstrom v Comer (1942) Ex. C.R. at p. 135). It is therefore necessary to review the prior art (cited) and consider its cumulative effect (vide De Frees and Betts Machine Co. v D.A. Acc. Ltd. 25 Fox Pat. C. 58 at 59) and then attempt to determine whether an invention in the rejected claims is present.

After studying the patent to Colburn we find that the basic concept of separating magnetic and non-magnetic materials by conveying the bulk materials on a conveyor towards a magnetic separator, which in turn draws the magnetic material from the bulk material is known in the art. The concept of using air blasts for cleaning etc., is also known (see, for example, air blast means 80 of Figure 6 supra). We find that all of the essential elements are known. Any patentable advance in the art, therefore, must be found in a novel combination which required a degree of inventive ingenuity for fruition. We must therefore, scrutinize the combination claims with a care proportional to the difficulty and improbability of finding invention in an assembly of old elements. The real ultimate question is whether the combination is obvious or not.

The applicant maintains that "... an analysis of the type performed by the Examiner would lead to the conclusion that there is no such thing as a system which is patentably unique." The facts however, do not coincide with this statement, because the examiner has indicated that claims 6 to 11 and 14 to 25 are in allowable form.

The applicant points out that "the conveyors of the Soper patent are not in line, nor do they move material in the same direction." Soper does of course show the use of endless belt type conveyors in magnetic separations. We therefore think it is immaterial whether the conveyors are in line or not, because the conceptual association is manifest by Soper. Any workable arrangement is normally within the skill of the trained worker in this field.

The applicant argues that in his system "the stream of air performs a separating function. In contradistinction, the air from the nozzle 80 serves a detaching function." This, in our view, is purely a case of semantics. In the cited art the "air blast" removes particles from the surface of the conveyor, while in the instant application it removes particles from the magnetic material on the conveyor. Surely, if there was a problem of dirt particles which should be removed, the answer is clearly inherent in the teachings of the Colburn patent (see air blast means 80 - Figure 6 - supra).

The applicant stated that he was not clear on why the examiner cited the Soper patent. Soper was cited to show what is common knowledge in the art. It discloses a means of purifying materials on endless belt conveyors by magnetic separation means.

The applicant discussed one particular space problem in Colburn, e.g. the length of the room. He correctly surmises that a chute would be preferable. Consider a height problem in the Colburn arrangement assuming that there is no room for the lower part of 70b. This problem could be solved by those skilled in the art by several ways. They could slant 70b, they could replace it by a channel shaped chute or as Soper has done (Figure 5), they could use an endless conveyor. These clearly are choices readily available to those skilled in the art without resorting to the use of the inventive faculty.

We turn now to a consideration of the claims. Claim 1 is essentially directed to two aligned, coplanar, endless conveyors mounted for co-directional rotation but separated by a gap. This gap is spanned by a magnetic conveyor operating above the plane of the gap to remove magnetic material from the first conveyor and deposit it upon the second conveyor. Air current means is used to separate non-magnetics (such as trapped particles) from the magnetics on the second conveyor. The non magnetic material from the first conveyor is discharged into the gap. Some other features are stressed such as the fact that the material is moving in the same general direction, or in other words the conveyor is "generally in line." As discussed above the prior art shows endless belt conveyors, a system of three conveyors operating in series with at least one separation gap and "air blast means" impinged on a conveyor for cleaning purposes. One of the essential differences is that in Colburn one of the conveyors is in the manner of a downwardly discharging conveyor or funnel. To substitute an endless conveyor for the discharging funnel is merely a matter of choice. Soper shows an endless conveyor conveying the magnetic particles to a storage space. Another difference is in the different arrangement of a well known principle of cleaning with the use of an "air blast means."

In view of the above discussion and considerations we are not satisfied that claim 1 is directed to a patentable advance in the art. In our view no result has been achieved which can be considered to have flowed from an inventive step. Patents cannot be sustained when their efforts are to substract from former resources freely available to skilled artisans. In other words it would, in our view, be an encroachment of the rights of artisans in this field to grant a monopoly on the teachings of claim 1. We recommend that claim 1 be refused.

Claims 2 to 5 and claims 12 and 13, which depend directly or indirectly on claim 1, refer to alternatives in design or structure. The arguments used in refusing claim 1 apply equally to them. They should also be refused.

Claims 26 to 31, which depend directly or indirectly on claim 1, specify various designs in the magnetic means of separation. These do not add features to claim 1 which would make them patentable combination. These claims should also be refused.

In summary, we are satisfied that claims 1 to 5, 12, 13 and 26 to 31 are not directed to a patentable advance in the art. We recommend that the decision in the Final Action to refuse these claims be affirmed.

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

I have studied the prosecution of this application and I concur with the recommendations of the Patent Appeal Board. Accordingly, I refuse to grant a patent on claims 1 to 5, 12, 13 and 26 to 31. I will however, accept claims 6 to 11 and 14 to 25. The applicant has six months within which to cancel the refused claims and submit the appropriate amendment, or to appeal my decision under the provision of Section 44 of the Patent Act.

J.H.A. Gariépy
Commissioner of Patents

Dated at Hull, Quebec
this 20th. day of October, 1977