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AND INTERFERENCES

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UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte RICHARD W. BIGELOW,
JEFFREY W. DRAWE
AND RICHARD L. SCHANK

Appeal No. 93-2154
Application 07/634,376¹

ON BRIEF

Before WINTERS, MEROS and WILLIAM F. SMITH, Administrative Patent Judges.

W. SMITH, Administrative Patent Judge.

DECISION ON APPEAL

This is an appeal from the final rejection of claims 20 through 37, all the claims pending in the application.

Claim 20 is illustrative of the subject matter on appeal and reads as follows:

20. A process for coating flexible belt having welded lap joint seams comprising providing a rectangular flexible web comprising a thermoplastic substrate and at least one imaging layer having an outer imaging surface, overlapping opposite ends of said web to form an overlapped seam having an overlap of between about 0.7 millimeter and about 4 millimeters, ultrasonically welding the overlapped ends together to form a flexible belt having a welded lap joint seam, forming on said

¹ Application for Patent filed December 27, 1990.

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thickness between about 2 micrometers and about 300 micrometers above the average surface of said welded lap joint seam at the centerline of said welded lap joint seam, said liquid coating comprising a film forming polymer and a fugitive liquid carrier which said belt is substantially insoluble, said outer imaging surface of said imaging layer having a surface energy exceeding the surface energy of said film forming polymer by at least about 30 percent based on the surface energy of said film forming polymer, and removing said fugitive liquid carrier to form a smooth solid coating strip having feathered edges on said welded lap joint seam, the distance of each edge of said solid coating strip from the centerline of said welded lap joint seam being between about 3 mm and about 10 mm.

The reference relied upon by the examiner is:

Yamazaki et al. (Yamazaki) 4,758,486 July 19, 1988

Claims 20 through 37 stand rejected under 35 U.S.C. § 103 as unpatentable over Yamazaki. We affirm the rejection as it applies to claims 20 through 22, 25 through 27, 29 through 35 and 37 and reverse the rejection as it pertains to claims 23, 24, 28 and 36.

**CLAIMS 20 THROUGH 22, 25 THROUGH 27,
29 THROUGH 32, 34 AND 35**

The argument directed to this group of claims is that the present invention requires an overlapped seam having a specified length which is seen by appellants to be distinguishable from the butt joint of the Yamazaki. However, this reading of Yamazaki is too narrow. Yamazaki does disclose that endless belt electrophotographic photoconductors as in the present invention have the shortcoming that the joint portion of the endless belt

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can be cracked or peeled off in the course of repeated use of the belt. Yamazaki also discloses that the buildup of toner on the joint portion of the endless belt presents a problem when the belt is cleaned in the process of copying. To solve this problem, Yamazaki covers the joint portion of an endless belt with an electroconductive overcoating layer. Optionally, a reinforcing layer can be formed along the joint under the electroconductive layer.

Appellants' characterization of the joint of the endless belt of Yamazaki as a butt joint is premised upon the joint illustrated in Figure 1 of the reference. However, the reference specification makes clear that the coating process of Yamazaki is not limited to the illustrated joint. Rather, the specification discusses the use of the disclosed coating method broadly to joints in endless belts used in electrophotographic process. Yamazaki specifically discloses that the belt may be joined together using an ultrasonic connecting method by fusing opposite ends of the belt. This is similar to if not the same as the ultrasonic welding of overlapped ends used in the present invention.

Furthermore, appellants' arguments in this regard do not take into account the statement made in the background portion of the present specification that photoreceptor belts have been made

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by overlapping the respective edges and ultrasonically welding to form an endless belt.

We agree with the examiner that one of ordinary skill in the art would have understood from a reading of Yamazaki that one method of forming the endless belt of that invention would be by ultrasonically welding overlapped ends of the belt material. In view of appellants' admission in the specification that this was a conventional technique for forming endless belts in this art area, we have no doubt that one of ordinary skill in this art would have found it obvious to form the belt of Yamazaki by this admittedly old prior art process.

Appellants also make reference to the specific dimensions of the seam set forth in claim 20. However, it is apparent from reading Yamazaki as well as appellants' admission regarding the prior art technique of forming these endless belts that the precise amount of overlap would be a result effective variable. Therefore, one of ordinary skill in the art would have routinely optimized this value. In re Boesch, 617 F.2d 272, 205 USPQ 215 (CCPA 1980).

The rejection of claims 20 through 22, 25 through 27, 29 through 32, 34 and 35 is affirmed.

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CLAIMS 23, 24 AND 36

We reverse the rejection as it pertains to these claims. Claims 23 and 36 require that the coating be in the form of an emulsion of film forming particles suspended in a fugitive liquid carrier. The coating composition of Yamazaki is described at column 3, lines 5-15 as a dispersion of a polymeric material, an appropriate solvent for the dissolving the polymeric material and finely-divided electroconductive particles. We agree with appellants that the ultimate composition described in this portion of the reference is a dispersion of electroconductive particles in dissolved polymeric material. That composition is not the emulsion required by claims 23 and 36. Thus, we reverse the rejection of these claims.

We reverse the rejection of claim 24 inasmuch as it limits the fugitive liquid carrier to being water. There is no suggestion in Yamazaki that the coating composition of that reference should be water based.

CLAIM 28

Claim 28 requires that the flexible belt comprise a thermoplastic substrate layer, an electrically conductive layer and a dielectric imaging layer. The examiner agrees with appellants that Yamazaki does not in and of itself teach or suggest that the belt of that reference includes a dielectric

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imaging layer. Rather, the examiner's position is that the use of such a layer is "well known in the art." However, that such a layer may be "well known in the art" does not mean that one of ordinary skill in the art would have found it obvious to use such a layer in the belt of Yamazaki. Absent a more cogent evidence based explanation by the examiner regarding the obviousness of the subject matter of this claim, we do not find that the examiner has properly established in the first instance that the subject matter of this claim would have been obvious to one of ordinary skill in the art.

CLAIM 33

Claim 33 requires that the coating be electrically insulating. Appellants argue that the coating material of Yamazaki is electroconductive and thus, does not suggest the subject matter of claim 33. However, the examiner's rejection of this claim is premised upon the reinforcing resin layer 6 of Yamazaki which is described to be a resinous copolymer which layer does not contain electroconductive particles. Therefore, one of ordinary skill in the art would reasonably conclude that that layer is electrically insulating. Appellants' response does not take into account layer 6 of Yamazaki. Accordingly, we affirm the rejection of claim 33.

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CLAIM 35

Claim 35 requires that the coating comprise a polymer binder/charge transport molecule composite. Appellants urge that we read this claim in light of the specification as being limited to the materials described as having this function therein. We decline to do so. In re Zletz, 893 F.2d 319, 13 USPQ2d 1320 (Fed. Cir. 1989). The examiner has urged that the electro-conductive particles of Yamazaki would be considered to be "charged transport molecules." Appellants urge that it is well known in the art that the electrically conductive particles of Yamazaki would not be characterized in this manner. However, appellants have not presented any evidence in support of this argument. Accordingly, we affirm the rejection of claim 35.

CLAIM 37

Appellants argue that the claimed process requires the use of a cleaning blade which is not taught by Yamazaki. However, as pointed out above, Yamazaki does describe the problems which arise at the joint portion of an endless belt used in an electro-photographic copying process during the cleaning process. Appellants again have admitted in the background portion of the present specification that cleaning blades are used for this purpose in this art. Therefore, we agree with the examiner that one of ordinary skill in the art would have found it obvious to

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