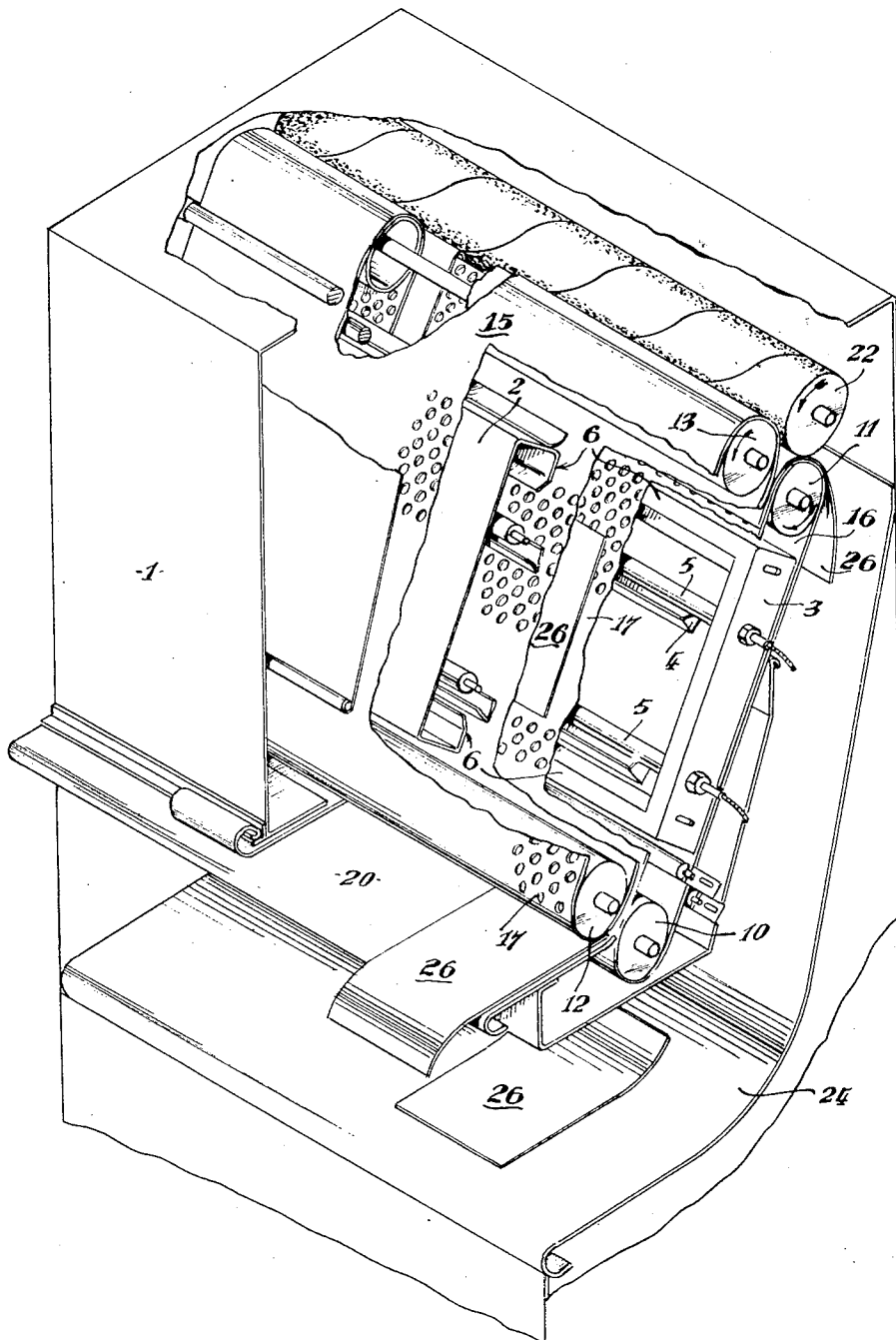


Nov. 5, 1957

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APPARATUS FOR DEVELOPING SENSITISED
MATERIAL BY GASES OR VAPOURS
Filed Feb. 4, 1955

2,811,909



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APPARATUS FOR DEVELOPING SENSITISED MATERIAL BY GASES OR VAPOURS

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Application February 4, 1955, Serial No. 486,219

Claims priority, application Great Britain February 19, 1954

4 Claims. (Cl. 95—89)

This invention relates to apparatus for developing sensitised material. It deals, more particularly, with apparatus for developing sensitised material by means of vapors.

Heretofore apparatus for developing sensitised material comprised in combination with a tank having at least one curved wall the central portion of which was provided with perforations permitting passage of developing vapors from within the tank, a first belt conveyor consisting of a flexible endless imperforate rubber belt mounted on at least a driving pulley and a series of idlers, the endless belt being positioned and tensioned to slide over and in close contact with the curved wall of the tank thereby overlying the central perforated portion of the wall and providing a seal against the escape of developing vapors.

In this apparatus the sensitised material is fed between the surface of the curved wall of the tank and the surface of the endless belt so that as the material passes over the perforated central portion of the wall of the tank the developing vapors contact the surface of the sensitised material which is to be developed. Thus it can be seen that in this apparatus the first frictional force exerted between the surfaces of the material and of the belt must exceed the second frictional force exerted between the surfaces of the material and of the curved wall of the tank.

This apparatus presents several disadvantages because sooner or later moisture or dirt will collect on the curved wall of the tank and at the edges of the perforated central portion of the curved wall thereby increasing the second frictional force to a point where not only the machine will not operate satisfactorily but the endless belt may be corroded and dirtied and the sensitised material will then be improperly developed besides being spoiled.

Some of the above disadvantages were sought to be avoided by adding in the apparatus described above a second belt conveyor consisting of an endless belt made from meshed or openwork material positioned between the first endless belt and the curved wall of the tank thereby permitting relatively free passage therethrough of the developing vapors. The sensitised material is fed to the apparatus between the two endless belts.

With this modified apparatus the danger of the material sticking or catching on the perforated central portion of the tank is largely avoided and slightly better diffusion of the developing vapors is obtained when the sensitised material is held just off the perforated surface. Nevertheless frictional force is now exerted between the surfaces of the material and of the second endless belt and the surface of the second endless belt of the curved wall of the tank so that sooner or later dirt and/or moisture will collect on the endless belts and on the curved wall of the tank and the sensitised material will again become improperly developed.

Actually the use of a perforated tank surface presents at least two major disadvantages, the metal between the

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perforations first restricts largely the free flow of developing vapors such as ammonia vapor over the sensitised material and second obstructs the passage of heat so that the vapors which may flow through the perforations are either entirely or partly condensed whereby the material is not properly developed, if at all.

Other known apparatus are identical to that already described with the sole difference that the central portion of the wall of the tank is cut away and idlers, which may even be perforated, are provided on the edge of the cut away wall of the tank. With this apparatus the sensitised material tends to be deflected into the tank by the idlers and even adhere to the latter. Also the developing vapors escape quickly from the tank and a satisfactory seal cannot be obtained whereby the developing vapors will be retained in the tank.

Thus it can be seen that in all known apparatus described above the developing vapors have a comparatively limited access to only one surface of the sensitised material while the other surface is in frictional engagement with the surface of an endless belt. The sensitised surface of the material is not only often damaged but it is hardly ever adequately and fully developed due to insufficient contact between the developing vapors and the sensitised surface.

It is an object of the present invention to provide apparatus for exposing simultaneously both surfaces of a sheet of sensitised material to developing vapors.

It is another object of the present invention to provide apparatus for developing sensitised material by passage through a substantially sealed chamber containing circulating developing vapors.

It is a further object of the present invention to provide apparatus for developing sensitised material upon exposure to developing vapors by exposing in its entirety the surface of said sensitised material to said developing vapors.

It is yet an object of the present invention to provide apparatus for developing sensitised material by passage through a developing vapor contact area between conveyor means.

Referring more particularly to the drawing, a perspective view of the apparatus is shown constructed in accordance with the present invention with some broken-out sections to show interior details of the apparatus and with one end wall removed.

The apparatus comprises a casing 1 in which are mounted tanks 2 and 3 fitted with vaporizing trays 4 and heater elements 5. Tanks 2 and 3 have an open face defined by marginal surroundings 6.

There is mounted in casing 1 in journals, not shown and forming no part of the invention, two pairs of idlers 10, 11 and 12, 13 respectively supporting endless perforated rubber conveyor belts 15 and 16 liberally provided with perforations 17. A guide 20 is positioned for enabling the sensitised material to be fed between the bottom rollers 10 and 12. The tanks 2 and 3 are spaced apart for a relatively short distance and the conveyor belts press lightly against the open tank faces. A top roller 22 revolves in the direction of the arrow and deflects the sensitised material issuing from between belts 15 and 16 so that the material falls down the delivery chute 24 behind the tank 3. Several sheets of sensitised material 26 are shown in the drawing. One sheet is being fed between the bottom idlers. Another is about to be released from between the top idlers. A third sheet is lying in the chute 24 after having passed through the apparatus.

With this construction it is found that the developing vapors are able to reach both the front and the rear of the sensitive sensitised layer coated on the sheet of previous material so that improved development results.

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Moreover since the sheet of material is positioned between two conveyor belts the sheet is never moved relatively to a stationary surface whereby damage to the sensitised layer is avoided and movement of the sheet of material is not obstructed by particles from the sensitised layer which would otherwise adhere to the stationary surface.

Although a single embodiment of the invention has been described and illustrated, it will be understood that various changes and modifications can be made therein without departing from the spirit of the invention as defined by the appended claims.

What is claimed is:

1. Apparatus for developing a sheet of sensitised material and comprising a hollow housing having spaced inlet and outlet slots, at least a pair of open ended tanks mounted in said housing with their mouths at their open ends closely opposed and facing each other, heating means in at least one of said open ended tanks, container means mounted in at least one of said tanks for receiving developing fluid adapted to be vaporized by said heating means, belt conveyor means including at least a pair of spaced parallel endless belts substantially filling the space between said mouths, each of said pair of open ended tanks being positioned within the loop of one of said spaced parallel endless belts, each of said spaced parallel endless belts including a portion continuously contacting the entire periphery of the mouth of the corresponding of said open ended tanks to thereby cover the latter, each of said portions of said spaced parallel endless belts including means permitting vaporized developing fluid within each of said open ended tanks to pass through said portions and contact one of the surfaces of said sheet of sensitised material thereby defining a vapor contact area between said mouths of said open ended tanks whereby when said sheet of sensitised material is inserted in said housing through one of said slots it is carried by said conveyor means through said vapor contact area where said sheet is exposed on both sides thereof to the developing action of said vaporized developing fluid, said portions of said spaced parallel endless belts being contiguous each with respect to the other and substantially filling the space between the periphery

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of the mouths of said open ended tanks whereby said vaporized developing fluid is substantially confined within said vapor contact area.

2. Apparatus constructed according to claim 1, wherein said housing is provided with guide means adjacent said inlet slot for directing said sheet of sensitised material up to said conveyor means and directing the developed sheet of sensitised material up to said outlet slot.

3. Apparatus for developing sensitised material and comprising a pair of open ended tanks disposed in closely spaced and opposed relationship with their mouths at their open ends facing each other, means for supplying said open ended tanks with developing vapor, and conveyor means including at least a pair of spaced endless belts substantially filling the space between said mouths, each of said open ended tanks being positioned within the loop of one of said spaced endless belts whereby said mouths of said open ended tanks are covered by a portion of said endless belts which continuously contacts the entire periphery of said mouths, said spaced endless belts each being provided with means affording that vaporized developing fluid within each of said open ended tanks passes through said spaced endless belts and contact said sensitised material thereby defining a vapor contact area between said mouths of said open ended tanks in which said sensitised material carried between said spaced endless belts is exposed to the developing action of said developing vapor.

4. Apparatus constructed according to claim 3, comprising guide means for directing said sensitised material up to and from said conveyor means.

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