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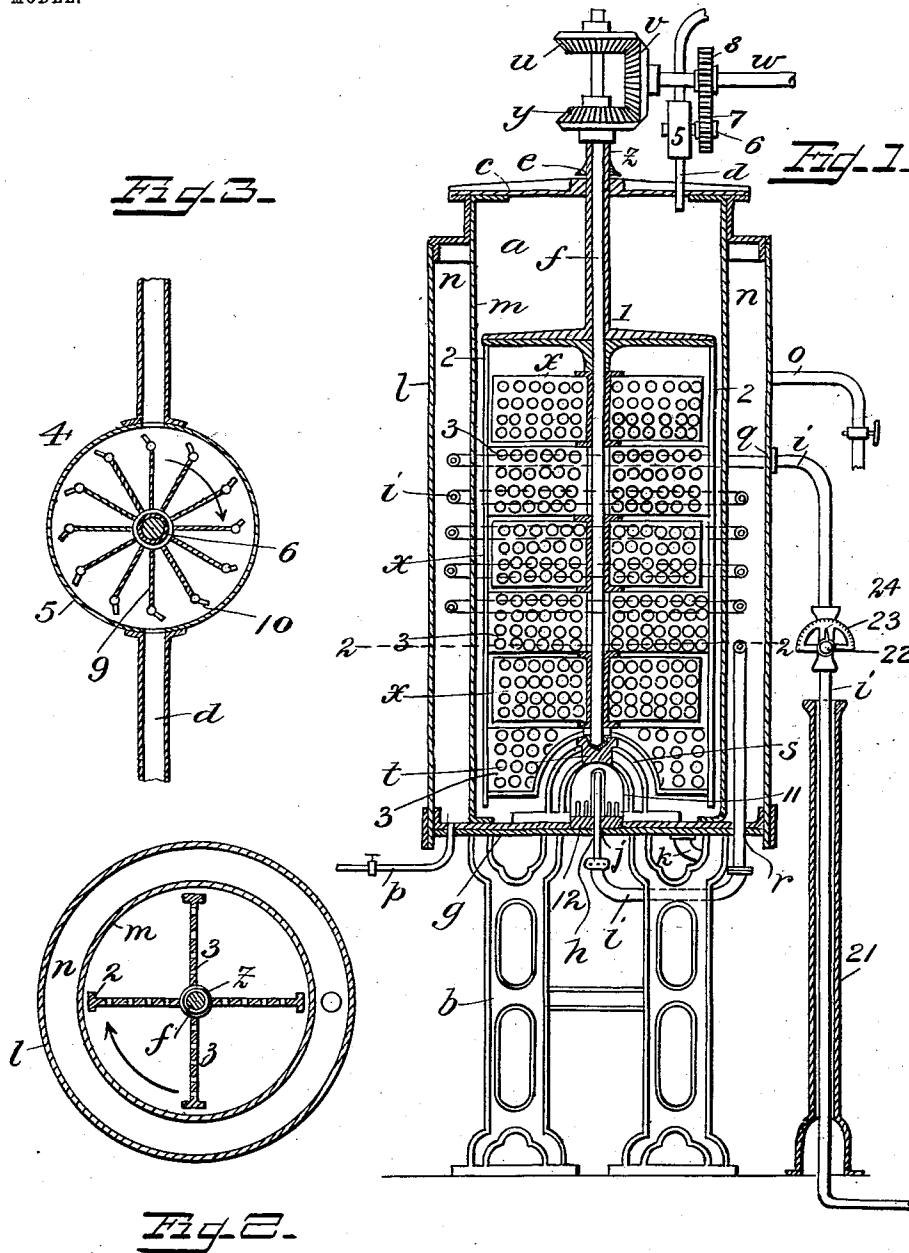
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APPARATUS FOR CONDENSING AND BLEACHING OILS.

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NO MODEL.



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APPARATUS FOR CONDENSING AND BLEACHING OILS.

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Application filed March 10, 1903. Serial No. 147,115. (No model.)

To all whom it may concern:

Be it known that I, STANISLAW LEWIAK, residing at Warsaw, Poland, Russia, have invented certain new and useful Improvements in
 5 Apparatus for Condensing and Bleaching Vegetable Oils; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and
 10 use the same.

The invention relates to an improved apparatus for bleaching (decolorizing) and condensing oils and other fluids to a desired density; hence, also, for the manufacture of varnish-oil, condensed oil, printers', lithographers', copper-plate printers', and gilders' varnish and also varnish for the manufacture of wax-cloth, leather-cloth, linoleum, American leather, and the like. Hitherto the oils
 15 were bleached either by exposing them in large metal vessels for a certain period, which as a rule would take several weeks, to the action of open air during sunlight, or in order to increase this action of the air upon the oil, and
 20 thereby accelerate the proceeding, special devices were used in which either the heated oil was caused to fall in drops through and in opposition to a current of dried or heated air or air was supplied at the lower part to the mass of
 25 oil heated by steam in suitable receptacles, whereupon the oil and the air were intimately intermixed by stirring. The bleaching effect upon the oil obtained by the use of both these devices is very unsatisfactory, however, considering the time necessary for carrying out
 30 the steps. Both these devices are also not equal to the purpose when higher degrees of density of the oils must be obtained without the use of a drier, as is the case with varnish
 35 for printing and lithographic inks, and much more so with copper-plating and gilding varnish or in the manufacture of linoleum and the like. To obviate all these drawbacks and to present an apparatus that would answer all
 40 the purposes and be capable of condensing the oils to any desired state of density without the use of driers is the object of the present invention. For embodying the invention the oil is heated by steam within a tightly-closed
 45 double-bodied boiler and air heated under

pressure within the apparatus forced at the lower part upward in bubbles or fine streams through the mass of oil contained in the boiler, the oil and the air being synchronously agitated by a peculiarly-constructed stirrer specially adapted to produce thorough mixing.
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In the accompanying drawings, which illustrate the invention, Figure 1 is a vertical longitudinal section of the apparatus; Fig. 2, a cross-section on line 2 2 of Fig. 1. Fig. 3 is
 60 a vertical sectional view of the fan and its casing and pipe *d*.

The boiler *a* for heating the oil is shown as resting upon standards *b*, but may be mounted upon any suitable foundation. The boiler
 65 *a* may be tightly closed by a cover *c*, provided with an air-pipe *d* and with a central bore *e*, receiving the shaft *f* of the stirrer. The boiler is provided with a peculiarly-constructed bottom *g*. The latter is provided centrally with
 70 a bore *h*, in which is fitted the air-pipe *i*, secured by a ring *j*, and the bottom also has an outlet-pipe *k* for such oils as remain after treatment in a liquid state. The boiler has
 75 two shells or casings *l* and *m*, arranged one within the other, return steam being admitted into the intermediate space *n* to heat the boiler through a pipe *o*. A waste-water-outlet pipe *p* communicates with the space *n*.
 80 The air-pipe *i*, which penetrates into the space *n* at *q* is helically coiled round the inner casing of the boiler, the other end protruding at *r*, from whence it is passed through the bottom *g* again into the boiler.

It will be easily understood that all the connections of the pipes within the space *n* must
 85 be very tight and secure, since the space is heated by steam at the temperature of some 100° centigrade and the pipes are, besides, expected to sustain an inner air-pressure of
 90 from two to four atmospheres.

The bottom *g* of the boiler supports the main step-bearing *t*, consisting of a number of semicircular metal strips laid crosswise
 95 against each other and connected together at the top. In this step-bearing *t* rotates the shaft *f*, receiving rotation by means of beveled cog-wheel *v* from the main shaft *w*. Upon the shaft *f* are mounted three sets of perforated blades *x*, each set consisting of four blades
 100

placed at right angles to each other. Meshing with the beveled cog-wheel *v* is a beveled cog-wheel *y*, mounted upon the tube or tubular shaft *z*, and thus the tube *z* rotates in a direction opposite to that of the shaft *f*, actuated by the beveled cog-wheel *u*.

Fixed at right angles to each other upon the tube *z* are four arms 1, their free ends carrying each a strap 2. These straps are extended down close to the bottom *g* of the boiler and have mounted upon them blades 3 similar to those upon the main shaft *f*. The blades 3 fill the spaces between the blades *x* and between the lowest blade *x* and the bottom *g*. It is evident that the blades *x* and 3 are thus adapted to revolve in opposition to each other, and thus uniform and thorough agitation of the oil is obtained.

When the blades revolve, the oil foams violently, the foam having a natural tendency to escape through the air-pipe *d*. To prevent this and at the same time to give free vent to the gases that are simultaneously generated, I provide a device in the form of a fan, presently described. Owing to this device, the air and the generated gases which penetrate into the pipe *d* can escape freely, while the foam is beaten down within the casing of the device and forced back into the boiler, where it is made to remain.

Underneath the step-bearing *t* of the shaft *f* is arranged a metal sieve or hood 11, provided round its lower part with a series of slots 12, the object of which is to more uniformly distribute the current of air to be forced upward through the mass of oil. Into this hood is introduced one end of the spirally-coiled air-pipe *i*. Air is forced into the boiler under constant pressure by means of an air-pump or any other suitable device.

The air-pipe *i* can be inclosed in a metal sleeve or jacket 21. The admission of air into the spiral pipe *i* and beneath the hood 11 is controlled by valve 22, provided with an index-scale 23 and pointer 24. This valve can be dispensed with, if desired.

The operation of the apparatus is as follows: The boiler *a* is filled with the oil or other fluid to about two-thirds of its capacity, whereupon steam being admitted into the space *n* the oil is heated to a temperature of at least 100° centigrade. The blades *x* and 3 are now made to revolve sufficiently fast to produce thorough agitation of the contents of the boiler *a* and their action uninterruptedly continued for about three hours—*i. e.*, until the desired degree of decolorization of the oil has been obtained. The valve 22 may during that time be kept closed and the pressure device kept inactive. The desired degree of decolorization having thus been obtained, the condensing of the oil may now be commenced. To this end the stirrer is kept in motion and the valve 22 gradually opened. The air heated by the spiral pipe *i* is now forced beneath the

hood 11 and from thence in fine bubbles or streams upward through the mass of oil, thereby contributing to the evaporation and escape of particles of water contained in the oil. Complete removal of all the watery parts is effected by the high temperature (not under 100° centigrade) combined with the action of the blades, which intimately intermix the introduced air with the oil. The air and the generated steam escape through the air-pipe *d*, while the foam is driven back into the boiler by the action of the fan. This proceeding is continued for about eleven hours, according to the desired degree of density, whereupon the oil, completely ready for use, may be run off through the tube *k* into suitable receptacles. After some fourteen hours' treatment there is formed within the boiler a tough elastic mass, (oil-caoutchouc,) which cannot be run off through the tube *k*, and in order to remove same the apparatus must be opened and the stirrer removed, whereupon the mass must be separated from the agitating-blades and the walls of the apparatus, and this is accomplished without difficulty by shoveling the mass out.

Oil that has undergone the above-described treatment is distinguished by a high degree of decolorization, fine gloss, and great elasticity, which qualities it is apt to preserve a very long time. At the same time it acquires the property of absorbing large quantities of liquids, with which it may be diluted. The process, as a matter of course, is much cheaper than the ordinary processes and much saving of time is effected. The whole of the work is accomplished within a few hours instead of several days and even weeks. To accelerate the drying of the oil condensed by the above-described process, the pressure-tube may, where circumstances will allow it, be extended through a retort filled with some body having the property of easily-yielding oxygen, when the oxygen will be forced through the pipe *i* into the boiler, thereby contributing to the prompt drying of the oil.

The fan or ventilator referred to above may consist of a casing 5, communicating with the pipe *d* and provided with an axle 6, rotated by a cog-wheel 7 mounted thereupon, meshing with cog-wheel 8 upon the shaft *w*. The axle 6 is provided with a number of radially-extending blades 9, with pivotally attached fingers 10 capable of yielding in a direction opposite to the rotation of the blades.

In condensing the different fluids the number of revolutions in the apparatus must be regulated according to requirements.

What I claim, and desire to secure by Letters Patent, is—

1. In an apparatus of the character described, the combination of a boiler composed of inner and outer shells or casings, means for admitting a heating medium to the space between said casings, an air-pipe arranged within

said space and adapted to discharge the heated air into the inner casing, and an agitating device arranged within the inner casing.

2. In an apparatus of the character described, the combination of a boiler composed of inner and outer shells or casings; means for admitting a heating medium to the space between said casings, an air-pipe arranged within said space, and having the discharge end communicating with the interior of the inner casing at the bottom thereof, and an agitating device arranged within the inner casing.

3. In an apparatus of the character described, the combination of a boiler composed of inner and outer shells or casings, means for admitting a heating medium to the space between the casings, an air-pipe arranged within said space and adapted to discharge heated air within the inner casing, and an agitating device arranged within the inner casing and comprising perforated blades, and means for rotating certain of said blades in one direction and the other blades in an opposite direction.

4. In an apparatus of the character described, the combination of a boiler composed of inner and outer shells or casings, means for admitting a heating medium into the space between said casings, an air-pipe arranged within the said space and adapted to discharge heated air within the inner casing, a shaft arranged vertically in the inner casing, blades carried by said shaft, a tubular shaft mounted on the first shaft, blades carried by said tubular

shaft, and means for rotating the shafts and the corresponding blades in opposite directions. 35

5. In an apparatus of the character described, the combination of a boiler composed of inner and outer shells or casings, means for admitting a heating medium into the space between said casings, an air-pipe arranged within said space and adapted to discharge heated air within the inner casing, an agitating device within the inner casing, a pipe leading from the upper portion of the inner casing, a casing in communication with said pipe, a shaft mounted in said last-mentioned casing, blades on said shaft, and fingers pivotally attached to said blades. 40 45

6. In an apparatus of the character described, the combination with a boiler composed of inner and outer shells or casings, means for admitting a heating medium within the space between said casings, an air-pipe arranged within said space and having its discharge end extending through the bottom of the inner casing, and a perforated hood arranged over the said discharge end of the air-pipe. 50 55

In testimony whereof I affix my signature in presence of two witnesses. 60

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Witnesses:

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