Sept. 25, 1956 L. J. SCHEID 2,764,289

APPARATUS FOR THE PREPARATION OF WOOD CHIPS

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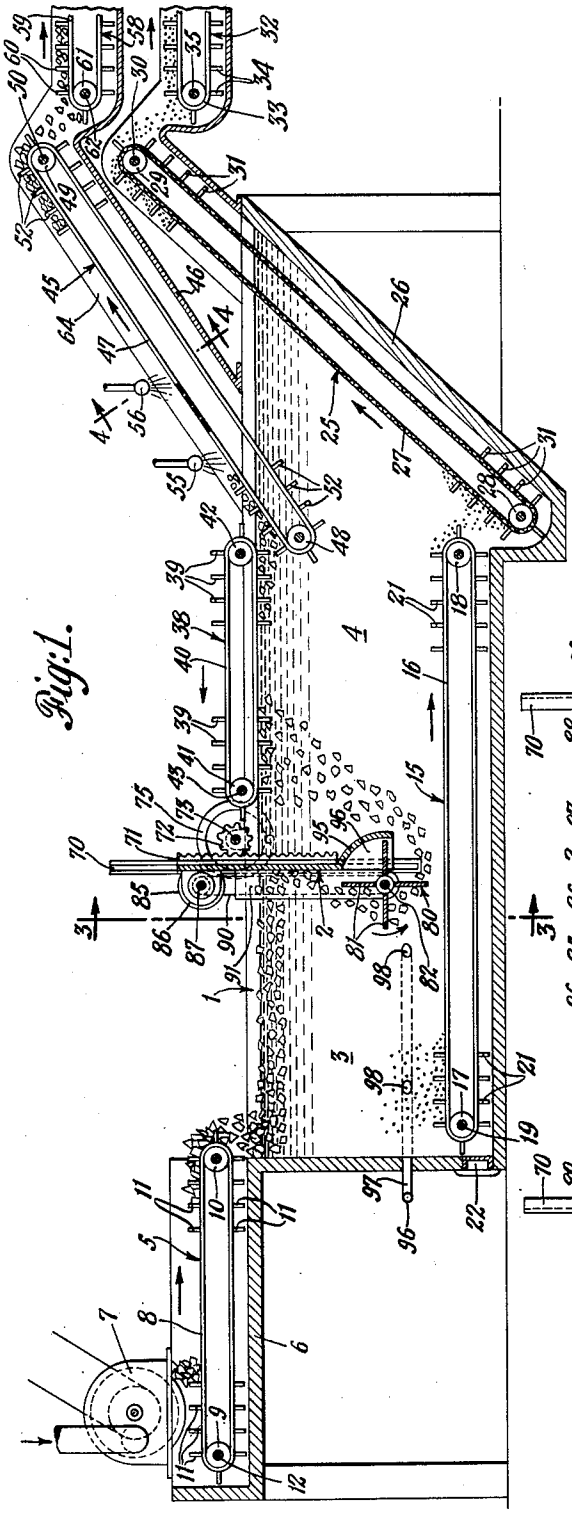


Fig. 1.

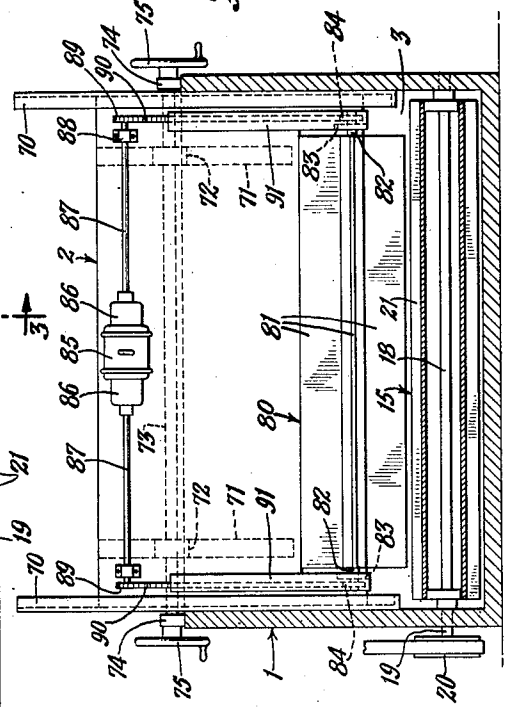


Fig. 3.

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Fig. 2.

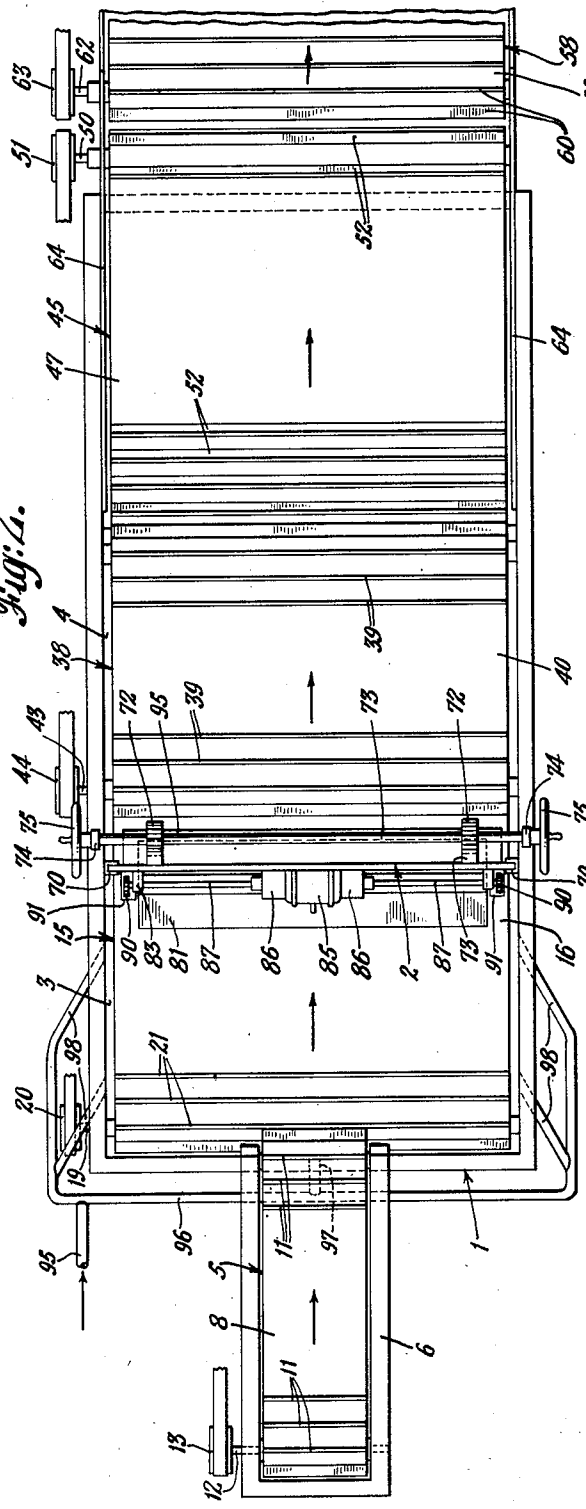
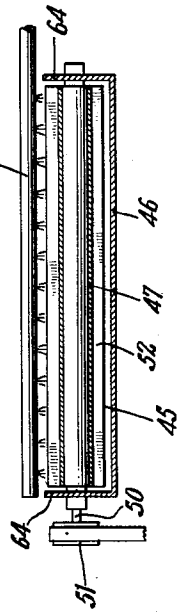


Fig. 4.



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United States Patent Office 2,764,289 Patented Sept. 25, 1956



2,764,289

# APPARATUS FOR THE PREPARATION OF WOOD CHIPS

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Application November 6, 1951, Serial No. 255,033

6 Claims. (Cl. 209—173)

This invention relates to apparatus for the preparation of wood chips for use in the manufacture of wood pulp.

A variety of mechanical methods have been developed for the debarking of wood used in the manufacture of wood pulp. Thus, both barking drums and barking machines have been in successful commercial use for many years in debarking many types of wood. The barking drums remove bark from logs, preferably water-soaked, by tumbling them in a rotating cylinder, while the barking machines remove the bark by cutting it off with knives rotating at high speed.

The physical characteristics of the bark of some species of wood are such that it cannot be removed satisfactorily and economically by the usual debarking methods. The younger trees of the Quaking Aspen (*Populus tremolides*) and of the Largetooth Aspen (*Populus grandidentata*) have bark which exhibit such physical characteristics when it is at all green. Heretofore, it has been necessary to remove such bark either by a manual operation in which the bark is split with a long-handled chisel, known as a spud, and then peeled off the wood, or by the use of a mechanical peeler of the hammermill type. The first of these methods is expensive due to the manual labor required, while the second requires a high initial investment for small installations which process a relatively low tonnage of wood and also requires considerable manual labor. Thus, both methods are expensive and materially increase the cost of wood preparation.

During periods of cool and of freezing weather the bark of these species of wood adhere so tightly that it cannot be peeled by either of these methods. This peculiarity of these woods creates a serious wood storage problem, since large and costly storage piles must be peeled in warm weather and maintained for winter supply.

These difficulties with the debarking of the Quaking Aspen, the Largetooth Aspen, and other species of woods having similar bark has presented formidable physical and economic obstacles to their use in the manufacture of paper. In my co-pending application, Serial No. 69,415, filed January 5, 1949, I have described a method for debarking such woods which avoids these difficulties. The method described in that application resulted from the observation of two properties of aspen wood and its bark. The first is a tendency of the bark to be knocked loose from the wood when chipped with the bark still in place. The second is the property of the bark, rotten wood, and sawdust to absorb water at a faster rate than the chips of sound wood. These properties are more clearly defined with the wood of the younger trees which carry smooth bark which is still green, than with the wood of old trees with heavier, more corky bark, and that method is most satisfactory when applied to the younger wood while it is still somewhat green.

By that method, aspen wood with its bark still in place is chipped, the resulting mixture of sound wood chips, slivers of bark, and any associated particles of rotten wood and dirt soaked in water or a dilute aqueous solution of a chemical assistant until the bark and any associated rotten wood has absorbed enough water to increase their specific gravities above that of water and the sound wood chips separated from the mixture by flotation in water or the aqueous solution of the chemical assistant. In chipping wood still carrying its bark, that method differs sharply from the usual procedures in which the wood is first freed of all bark and then chipped. By chipping wood still carrying its bark, I secure a mixture of sound wood chips, bark slivers, and frequently associated particles of rotten wood and dirt which has been carefully avoided in past procedures.



The chipping operation in my method is identical with that ordinarily used with debarked wood to produce chips for the manufacture of wood pulp. The familiar Carthage chipper is, for example, suitable for this operation. Briefly, it consists of a flat disk of solid cast iron mounted in a vertical plane on a horizontal shaft. The disk carries three or four knives and is rotated at a high velocity. The wood is sliced across-grain into chips ordinarily approximating seven-eighths of an inch in thickness. The majority of the chips are usually from one-half to three-quarters of an inch square. However, the exact size of the chips produced is in no way critical in carrying out the method in accordance with that invention.

Now, it is the object of this invention to provide apparatus in which the soaking and flotation steps may be carried out in a continuous manner. The chipping operation in my method is substantially a continuous operation as carried out in normal mill practice, particularly when several chippers are utilized. By the use of the apparatus in accordance with this invention, I am able to carry out the soaking and flotation steps in a continuous manner and thereby secure the advantages arising from the continuous operation of my entire procedure.

Other objects and advantageous features of this invention will become apparent from the detailed description thereof which follows.

The apparatus in accordance with this invention comprises essentially a soaking and flotation chamber which has an adjustable baffle dividing it into two compartments connected by a fluid passage adjacent its bottom One of these compartments functions primarily as a soaking compartment and the other as a flotation compartment. The chamber is provided with at least one conveyor which carries a mixture of wood chips, slivers of bark and any associated rotten wood and dirt from the pit of a chipper and dumps it into the soaking compartment of the chamber. It is also provided with a skimmer and a conveyor system which sweeps floating chips from the top layer of liquid in the flotation chamber and carries them away from the chamber, while draining excess liquid from them and returning it to the chamber. The bottom of the chamber is provided with a conveyor which sweeps out material which sinks to the bottom of the liquid in the chamber and carries it out of the chamber.

In the operation of this apparatus, the mixture of wood chips, slivers of bark and any associated rotten wood and dirt resulting from the chipping of Quaking Aspen, the Largetooth Aspen or a species of wood having similar bark, which still carries its bark, is carried by the conveyor from the pit of the chipper and deposited in the soaking compartment of the apparatus, which is substantially filled with water, preferably maintained at an elevated temperature, or an aqueous solution of a chemical assistant, such as, for example, an alkaline material or a wetting agent.

Both the chips and slivers of bark at first float in the aqueous liquid in the soaking chamber, but as the soaking proceeds the bark loses its buoyancy and settles to the bottom of the chamber. Any rotten wood and dirt

similarly sinks to the bottom of the tank. The slivers of bark, and any rotten wood and dirt which settles to the bottom of the tank is continuously removed and deposited outside of the chamber by the conveyor in the bottom of the chamber.

As the chip mixture is deposited in the soaking chamber the floating layer becomes progressively thicker with the chips and slivers of bark first dumped on the bottom of the layer. When this layer accumulates to a thickness such that the lower chips are below the bottom of the baffle separating the soaking and the flotation chambers, they pass under the baffle and rise in the flotation chamber. They are then removed from the surface layer of the liquid in that chamber and deposited outside the chamber by the skimmer and its associated conveyor system.

As discussed in detail in my co-pending application, Serial No. 69,415, filed January 5, 1949, the length of time which the chip mixture is soaked must be adjusted to allow the slivers of bark and any associated rotten wood sufficient time to absorb enough water to destroy their buoyancy, but insufficient time for the chips of sound wood to lose their buoyancy. The actual length of time required depends upon the temperature of the soaking water, whether or not a chemical assistant is present in the water, the nature and concentration of the chemical assistant and the age of the trees from which the chip mixture is derived.

In the operation of the apparatus in accordance with this invention, the length of the soaking period is determined by the rate at which the chip mixture is fed to the soaking compartment, the depth to which the baffle separating the soaking and flotation chamber is immersed in the aqueous soaking liquid and the horizontal dimensions of the soaking compartment. In my apparatus, the adjustable baffle provides a convenient and effective method of controlling the length of the soaking period and compensates for any variations in the rate at which the chip mixture is fed to the soaking compartment. With a uniform rate of feed, the soaking period is shortened by raising the baffle or, conversely, lengthened by lowering it. The baffle is raised to compensate for a decreased rate of feed and to maintain a uniform soaking period. It is lowered to compensate for an increased rate of feed.

Having now indicated in a general way the nature of my invention, I will proceed with a more detailed description thereof with reference to the accompanying drawings in which like reference characters are used to refer to like parts. In the drawings:

Figure 1 is a cross-sectional, elevation view of the apparatus in accordance with this invention,

Figure 2 is a plan view of the apparatus in accordance with this invention,

Figure 3 is a cross-sectional, elevation view along the section line 3—3 of Figure 1, and

Figure 4 is a cross-sectional view along the section line 4—4 of Figure 1.

Referring specifically to Figures 1 and 2, the numeral **1** designates generally the soaking and flotation chamber of the apparatus in accordance with this invention, which is provided with an adjustable baffle **2** dividing the chamber into a soaking compartment **3** and a flotation compartment **4**. The soaking and flotation chamber **1** may be made of steel, concrete or other suitable waterproof, structural material which is unaffected by water or by any aqueous solution of a chemical assistant which is to be used therein. It may be made rectangular in plan with the baffle **2** extending across the narrow dimension.

The conveyor **5** extends from the pit **6** of a chipper **7** to the edge of the soaking compartment **3** and is adapted to convey a mixture of wood chips, slivers of bark and any associated rotten wood and dirt produced by the chipping of wood which still carries its bark from the pit **6** of the chipper **7** and to dump it into the soaking compartment **3**. The conveyor **5** consists of a continuous belt **8** carried by the pulleys **9** and **10** and has a series of bars **11**, **11**, **11** . . . across its surface to prevent the chip mixture from slipping. The pulley **9** is connected through its shaft **12** to a belt driven pulley **13**.

The conveyor **15** extends along the bottom of the chamber **1** and is adapted to carry slivers of bark, rotten wood and dirt which sinks to the bottom of the water or of an aqueous solution of a chemical assistance substantially filling the chamber **1**. This conveyor is similar in construction to conveyor **5** and consists of a continuous belt **16** substantially the same width as the chamber **1**, carried by the pulleys **17** and **18**. The pulley **17** is connected through its shaft **19** to a belt driven pulley **20** positioned outside the chamber **1**. The belt **16** has bars **21**, **21**, **21** . . ., positioned across its surface to prevent slippage of the bark mixture which it carries.

The end wall of chamber **1** is provided with a port **22** adjacent the end of the conveyor **15** to allow any material which collects at the end of the conveyor to be cleaned out periodically.

The conveyor **25** is positioned at the end of conveyor **15**, and extends up the ramp **26**. It is adapted to receive the bark mixture from conveyor **25** and carry it out of the chamber **1**. This conveyor is similar in construction to conveyor **15** and consists of a continuous belt **27**, carried by pulleys **28** and **29**. The continuous belt **27** is preferably made of wire mesh which is sufficiently fine to retain the slivers of bark, rotten wood and dirt, while allowing water to drain through. Pulley **29** is connected through its shaft **30** to a suitable source of power, for example, a belt driven pulley. The belt **27** has a series of bars **31**, **31**, **31** . . . extending across its surface to prevent the bark mixture from slipping.

The conveyor **25** may simply dump the bark mixture outside the chamber **1** or as shown by drawings, deliver it to another conveyor **32** which carries it to a point remote from the chamber for use, for example, as a fuel. The conveyor **32** is similar in construction to conveyor **25**. It consists of a continuous belt **33** having bars **34**, **34**, **34** . . . across its surface. It is carried on pulleys one of which is shown at **35**.

The skimmer **38** is provided with a series of blades **39**, **39**, **39** . . . which sweep the surface layer of a liquid substantially filling the flotation chamber **4**. The skimmer blades **39**, **39**, **39** . . . are carried by a continuous belt **40** positioned on pulleys **41** and **42**. Pulley **41** is connected through its shaft **43** to a belt driven pulley **44**. Alternatively, the skimmer blades may, for example, be carried at each of their ends by belts or chains carried by suitable pulleys.

The skimmer **38** is adapted to propel chips floating on or near the surface of a liquid in the flotation chamber **4** to the lower end of the conveyor **45** which is positioned on the ramp **46**. It consists of a continuous belt **47** carried by pulleys **48** and **49**. The continuous belt **47** is, preferably, provided with perforations to allow water to drain freely from the wood chips. It may, for example, be made of a wire mesh. Pulley **49** is connected through its shaft **50** to a belt driven pulley **51**. The continuous belt **47** is provided with cross bars **52**, **52**, **52** . . . to prevent slippage of chips on the belt.

The conveyor **45** lifts the wood chips out of the flotation liquid which, as already noted, may be an aqueous solution of a wetting agent or an alkaline material. The conveyor **45** may have perforated shower heads **55** and **56** positioned above and extending across its width to provide showers of water for washing the chips free of the aqueous solution of the wetting agent or alkaline material.

The conveyor **58** is positioned at the end of conveyor **45** and is adapted to carry chips deposited by conveyor **45** to a point remote from my apparatus where they are either used immediately in the preparation of wood pulp or stored for future use. The conveyor **58** is similar in

construction to conveyor 32 and consists of a continuous belt 59, which has a series of cross-bars 60, 60, 60 . . . across its surface to prevent the chips from slipping. It is carried on two pulleys one of which is shown at 61 in the drawings. The pulley 61 is connected through its shaft 62 to a belt driven pulley 63.

Figure 4 shows a cross-sectional view through the conveyor 45, its ramp 46 and the shower head 56. It will be seen in this figure that the ramp 46 is provided with sides 64, 64 which form a trough to return the water or aqueous solution draining from the wood chips to drain back into the chamber 1. The ramp 26 of conveyor 25 is similarly provided with sides as shown by the drawing.

In the drawings and the foregoing, I have shown and described the conveyors 5, 15, 25, 32, 45 and 56 as consisting essentially of continuous belts which carry their respective burdens. This type of conveyor has been chosen solely for the purposes of illustration and, alternatively, I may use drag conveyors which pull the materials involved over a stationary surface.

The baffle 2 which divides the chamber 1 into a soaking compartment and a flotation compartment, may be positioned substantially in a vertical plane. Its vertical edges are positioned in channels 70, 70 which permit it to slide up and down. It is provided with the racks 71, 71 which engage the pinions 72, 72 which are mounted on a shaft 73 which may be rotated from either end by one of the hand wheels 75, 75. The shaft 73 is mounted in bushings 74, 74 positioned on the upper edges of the side walls of the chamber 1. The hand wheels 75, 75 are mounted on the outer ends of the shaft 73. This rack and pinion assembly provides a convenient means of adjusting, raising or lowering, the baffle 2 by the rotation of one of the hand wheels 75, 75.

As an alternative to the use of hand wheels 75, 75 and manual power to raise and lower the baffle 2, I may utilize an electric motor provided with suitable reducing gears. I find that the use of an electric motor or other source of mechanical power is sometimes desirable to secure the advantages of remote control and frequently desirable in the case of larger installations in which the baffle 2 is large.

In the case of larger installations in which the baffle 2 is large, it is usually desirable to provide counterweights (not shown by the drawings) for the baffle 2 and the equipment which it carries to make it easier to raise and lower. Counterweights can be hung outside the chamber 1 on cables passing over pulleys positioned at the top of the guide channels 70, 70 and attached to the top of the baffles. In addition, it is also sometimes desirable to provide a friction lock to lock the baffle in position after it has been suitably adjusted by means of one of the hand wheels 75, 75 or by means of mechanical power.

The baffle 2 may carry a paddle 80 mounted near its lower edge to propel chips floating in the soaking chamber 3 into the flotation chamber 4. The paddle 80 consists of four blades 81, 81, 81, 81 mounted on a shaft 82 which is positioned near each end in a bushing 83 which is mounted directly on the baffle 2. Each end of the shaft 82 carries a pinion 84.

The baffle 2 carries an electric motor 85 and suitable reducing gears 86, 86 mounted near its upper edge. The reducing gears 86, 86 are connected to the shafts 87, 87 mounted in bushings 88, 88 which like the motor 85 and the reducing gears 86, 86 are mounted directly on the baffle 2. Each of the shafts 87, 87 carries a pinion 89 on its outer end which is connected to the corresponding pinion 84 on the paddle wheel shaft 73 by a chain drive 90. The portion of the chain drives 90, 90 which are below the normal liquid level of chamber 1 and the pinions 84, 84 are surrounded by casings 91, 91 to keep floating chips from fouling the drive during the operation of the apparatus.

The lower section of the baffle 2 forms a section of a cylinder 95 to provide clearance for the blades 81, 81, 81, 81 of the paddle 80 and permit it to function more efficiently in propelling chips under the baffle. This curved portion 95 of the baffle is desirably closed at each end by the sections 96, 96 which may, if desired, form a part of the casings 91, 91.

It is usually desirable to operate this apparatus with the water contained therein at an elevated temperature. The water may be heated by the direct introduction of steam into the water and the currents created by the steam utilized to assist in directing the wood chips under the baffle 2. The conduit 95 from a suitable steam source is connected to a header conduit 96 which is, in turn, connected to branch conduits 97 and 98, 98, 98, 98 which enter the soaking compartment 3 at a level below the bottom of the baffle 2. The branch conduits 97 enter at the end of the compartment 3 opposite the baffle while 98, 98, 98, 98 enter at an angle, so that the steam which enters through these conduits is traveling in the direction of the opening under the baffle.

Before being placed into operation the soaking and flotation chamber 1 of my apparatus is filled with water or with an aqueous solution of a wetting agent or an alkaline material to a level near its top and to one at which the blades 39, 39, 39 . . . of the skimmer 38 are immersed in the water. The water may and preferably is heated by introducing steam into it through the conduits 97 and 98, 98, 98, 98.

In the operation of this apparatus, wood still carrying its bark is chipped by the chipper 7 to produce a mixture of sound wood chips, slivers of bark and usually some particles of rotten wood and dirt. This mixture is carried by the conveyor 5 to the soaking compartment 3 and dumped into the water or aqueous solution therein. As the chip mixture accumulates in the soaking compartment 3, the chips first introduced are forced to lower and lower levels in the water therein until those first in reach the level of the currents created by the steam jets, the paddle 80 and the conveyor 15, and are carried under the baffle 2.

The time required between the original immersion of the chip mixture in the water and their passage under the baffle 2 is adjusted to be long enough for the slivers of bark and particles of rotten wood to lose their buoyancy, but insufficient for the sound wood chips to lose their buoyancy. This time is adjusted, generally, in the original design of the apparatus in terms of the rate at which the chip mixture is fed to the soaking compartment, by the dimensions of the soaking compartment and, particularly, the cubic volume of the water which it contains above the level of the bottom of the baffle 2 when the baffle is adjusted to its median position. This time is adjusted in the case of a particular installation to compensate for variations in the rate at which the chip mixture is fed to the soaking compartment and other variables in the operation by raising the baffle 2 to shorten the soaking period or lowering it to lengthen it by rotating one of the hand wheels 75, 75 in the indicated direction.

In the apparatus illustrated by the drawings, the rotation of the padle 80, the steam jets issuing from the conduits 97 and 98, 98, 98, 98 and the operation of the conveyor 15 all cooperate to create a current under the baffle 2 and contribute to an efficient movement of the sound wood chips from the soaking compartment 3 to the flotation compartment 4. However, all of these influences are unnecessary, particularly in the lower capacity installations and I have found that I may dispense with the steam jets, the paddle 80 or with both. The floating chips in the soaking compartment tend to move under the baffle by the current created by the operation of the conveyor 15 and are actually carried under by the cross-bars 21, 21 . . . at any time they mat in the soaking chamber and

accumulate sufficiently to be forced down to the zone in which those cross-bars travel.

The slivers of bark and particles of rotten wood and dirt sink in the soaking compartment and settle on the conveyor 15. Any such material which is mechanically entrapped and carried by the sound wood chips is freed as those chips pass under the baffle 2 and rise in the flotation compartment 4 and, similarly, settles on the conveyor 15. The slivers of bark and associated material which settle either in the soaking or the flotation chambers are carried by the conveyor 15 to the conveyor 25 which lifts them out of the water, drains them while returning the water to the flotation compartment and deposits them on the conveyor 32, which carries them away from the apparatus for use, for example, as fuel.

The sound wood chips rising to the surface of the water in the flotation chamber are propelled by the skimmer 38 to the conveyor 45 on which they are drained and, if desired, rinsed free of residual treating chemicals, and carried to the conveyor 58. The conveyor 58, in turn, carries these chips to be made into wood pulp or to be stored for later use.

The required time of soaking of the chip mixture in the soaking compartment 3 of my apparatus is determined by the temperature of the soaking water and the presence or absence of dissolved chemical assistants, such as, surface active agents and alkaline materials. This time of soaking, for any given set of conditions within the soaking compartment 3, can be materially shortened by pre-soaking the logs in hot water before they are reduced to a chip mixture by the chipper 7. This pre-soaking operation can be conveniently carried out in a hot pond (not shown by the drawings) from which the logs are conveyed to the chipper 7 for chipping by a suitable conveyor.

What I claim and desire to protect by Letters Patent is:

1. Apparatus for the separation of sound wood chips from a mixture of such chips and slivers of bark by a process of soaking and flotation in an aqueous fluid, which comprises an elongated chamber adapted to retain a body of an aqueous fluid, means for furnishing steam directly to the body of aqueous fluid in the said chamber, a baffle extending across the width of the said chamber and downwardly into the chamber which is adjustable as to the depth to which it extends into the chamber and which divides the said chamber into a soaking compartment and a flotation compartment connected by a fluid passageway, a means for conveying a mixture of sound wood chips and slivers of bark from the pit of a chipper to the top of the said soaking compartment, a means for removing floating chips from the surface layer of an aqueous fluid in the flotation compartment, and a means for removing slivers of bark from the bottom of the said chamber.

2. Apparatus for the separation of sound wood chips from a mixture of such chips and slivers of bark by a process of soaking and flotation in an aqueous fluid, which comprises an elongated chamber adapted to retain a body of an aqueous fluid, means for furnishing steam directly to the body of aqueous fluid in the said chamber, a baffle extending across the width of the said chamber and downwardly into the chamber which is adjustable as to the depth to which it extends into the chamber and which divides the said chamber into a soaking compartment and a flotation compartment connected by a fluid passageway, a conveyor for continuously transporting a mixture of sound wood chips and slivers of bark from the pit of a chipper to the top of the said soaking compartment, a skimmer and an associated conveyor for removing chips from the surface of the flotation chamber, draining excess liquid from them, returning the liquid to the flotation chamber, and depositing the drained chips outside the said chamber, and a conveyor system for removing slivers of bark from the bottom of the said chamber and depositing them outside the said chamber.

3. Apparatus for the separation of sound wood chips from a mixture of such chips and slivers of bark by a process of soaking and flotation in an aqueous fluid, which comprises an elongated chamber adapted to retain a body of an aqueous fluid, means for furnishing steam directly to the body of aqueous fluid in the said chamber, a baffle extending across the width of the said chamber and downwardly into the chamber and which divides the said chamber into a soaking compartment and a flotation compartment connected by a fluid passageway, an agitator positioned in the soaking compartment and adapted to agitate floating chips and to propel them under the said baffle and into the flotation compartment, a conveyor for continuously transporting a mixture of sound wood chips and slivers of bark from the pit of a chipper to the top of the said soaking compartment, a skimmer and an associated conveyor for removing chips from the surface of the flotation chamber, draining excess liquid from them, returning the liquid to the flotation chamber, and depositing the drained chips outside the said chamber, and a conveyor system for removing slivers of bark from the bottom of the said chamber and depositing them outside the said chamber.

4. Apparatus for the separation of sound wood chips from a mixture of such chips and slivers of bark by a process of soaking and flotation in an aqueous fluid, which comprises an elongated chamber adapted to retain a body of an aqueous fluid, a baffle extending across the width of the said chamber and downwardly into the chamber which is adjustable as to the depth to which it extends into the chamber and which divides the said chamber into a soaking compartment and a flotation compartment connected by a fluid passageway, jets for furnishing steam to the body of aqueous fluid in the said soaking chamber at least two of which are positioned to create a current under the said baffle from the soaking compartment to the flotation compartment which is adapted to move floating chips under the said baffle, a conveyor for continuously transporting a mixture of sound wood chips and slivers of bark from the pit of a chipper to the top of the said soaking compartment, a skimmer and an associated conveyor for removing chips from the surface of the flotation chamber, draining excess liquid from them, returning the liquid to the flotation chamber, and depositing the drained chips outside the said chamber, and a conveyor system for removing slivers of bark from the bottom of the said chamber and depositing them outside the said chamber.

5. Apparatus for the separation of sound wood chips from a mixture of such chips and slivers of bark by a process of soaking and flotation in an aqueous fluid, which comprises an elongated chamber adapted to retain a body of aqueous fluid, a baffle extending across the width of the said chamber and downwardly into the said chamber, which divides the said chamber into a soaking compartment and a flotation compartment connected by a fluid passageway, two racks positioned on the flotation compartment side of said baffle and two pinions meshing therewith mounted on a shaft extending across the top of the said chamber, the said rack and pinions being adapted to raise and lower the said baffle to adjust the height of the said passageway under it, a paddle mounted on a shaft carried by bushings and connected to a source of rotary power mounted on the soaking compartment side of the said baffle, the said paddle being located with respect to the bottom of the said baffle in a position and otherwise adapted to propel floating wood chips through the said passageway under the baffle, a conveyor for continuously transporting a mixture of sound wood chips and slivers of bark from the pit of a chipper to the top of the said soaking compartment, a skimmer and an associated conveyor for removing chips from the surface of the flotation chamber, draining excess liquid from them, returning the liquid to the flotation chamber, and depositing the drained chips outside the said chamber, and a conveyor system for removing slivers of bark from the bottom of

the said chamber and depositing them outside the said chamber.

6. Apparatus for the separation of sound wood chips from a mixture of such chips and slivers of bark by a process of soaking and flotation in an aqueous fluid, which comprises an elongated chamber adapted to retain a body of aqueous fluid, a baffle extending across the width of the said chamber and downwardly into the said chamber, which divides the said chamber into a soaking compartment and a flotation compartment connected by a fluid passageway, two racks positioned on the flotation compartment side of said baffle and two pinions meshing therewith mounted on a shaft extending across the top of the said chamber, the said rack and pinions being adapted to raise and lower the said baffle to adjust the height of the said passageway under it, a paddle mounted on a shaft carried by bushings and connected to a source of rotary power mounted on the soaking compartment side of the said baffle, the said paddle being located with respect to the bottom of the said baffle in a position and otherwise adapted to propel floating wood chips through the said passageway under the baffle, a plurality of steam conduits having orifices inside the walls of the soaking chamber at a level below the bottom of the said baffle which are directed toward the opening under the said baffle, a conveyor for continuously transporting a mixture of sound wood chips and slivers of bark from the pit of a chipper to the top of the said soaking compartment, a skimmer and an associated conveyor for removing chips from the surface of the flotation chamber, draining excess liquid from them, returning the liquid to the flotation chamber, and depositing the drained chips outside the said chamber, and a conveyor system for removing slivers of bark from the bottom of the said chamber and depositing them outside the said chamber.



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