

No. 752,573.

PATENTED FEB. 16, 1904.

W. M. MORSE.
PROCESS OF MAKING CHIP SOAP.

APPLICATION FILED APR. 10, 1903.

NO MODEL.

4 SHEETS—SHEET 1.

Witnesses:
C. H. C. 1903
W. M. Morse

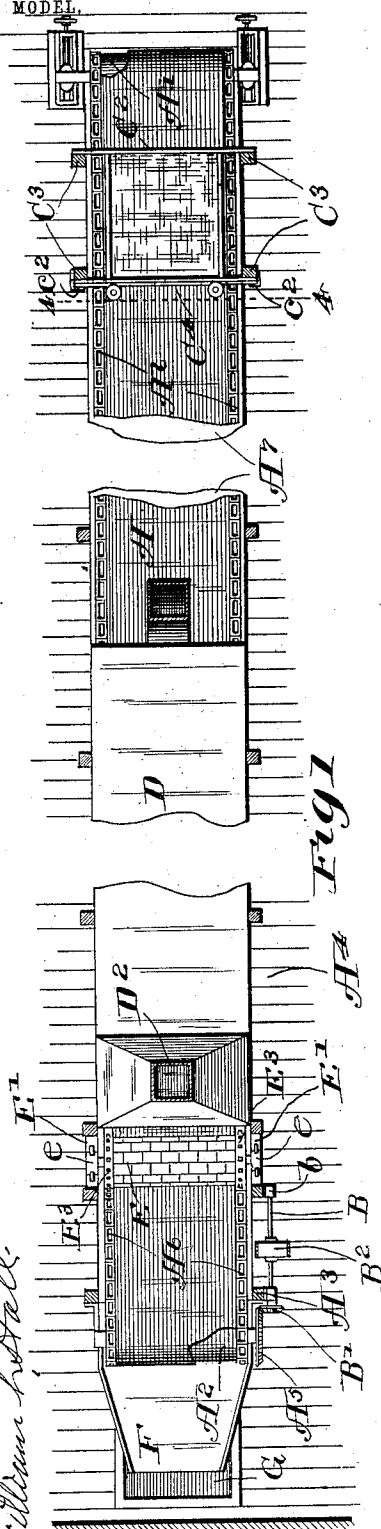


Fig 1

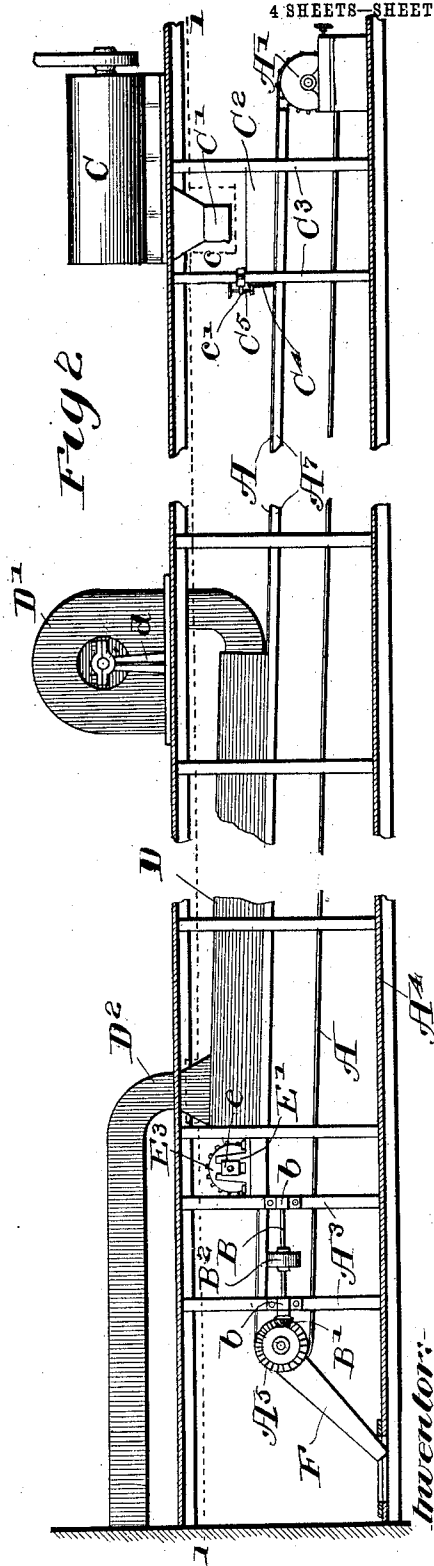


Fig 2

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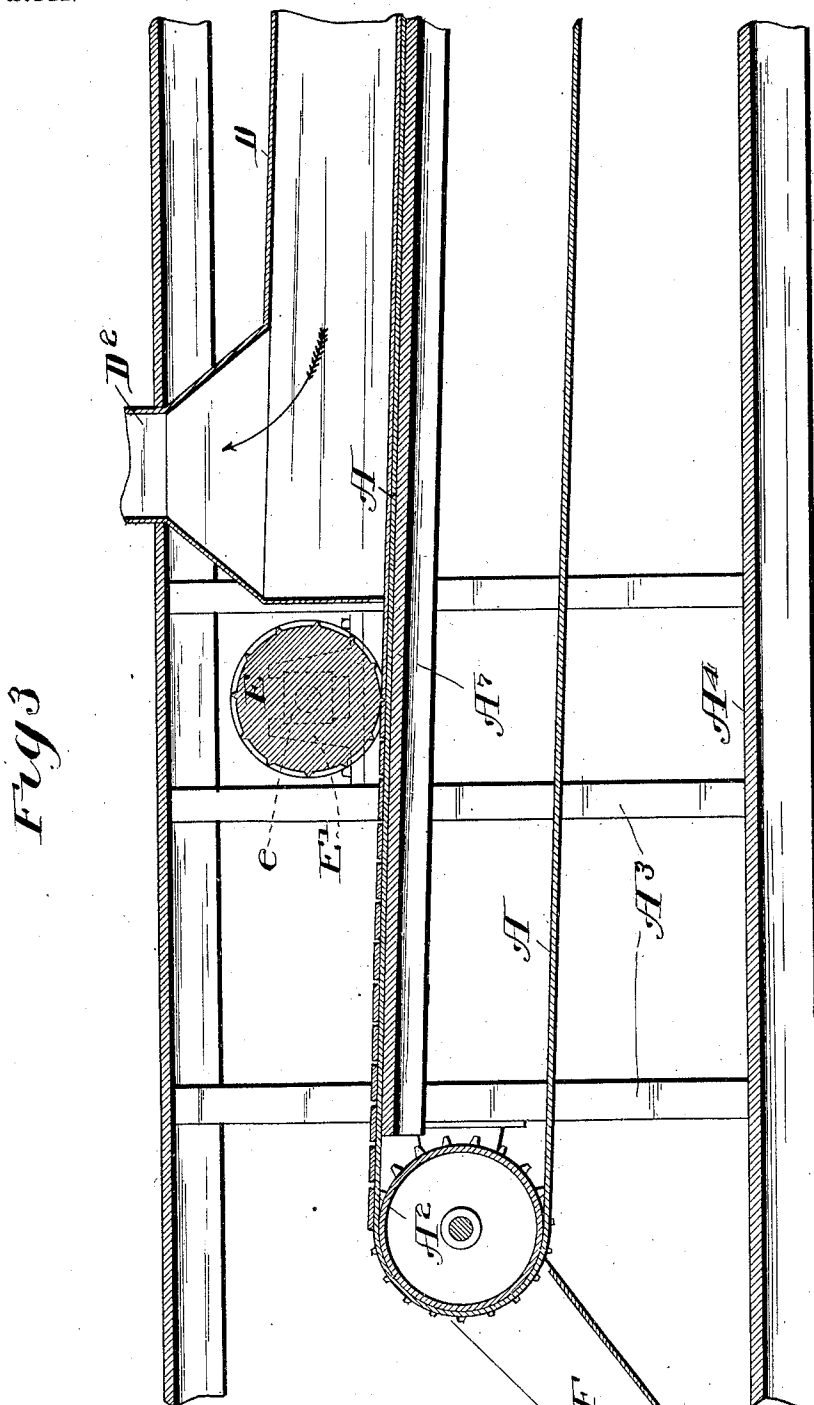
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4 SHEETS—SHEET 2.



Witnesses:

Carl S. Crawford
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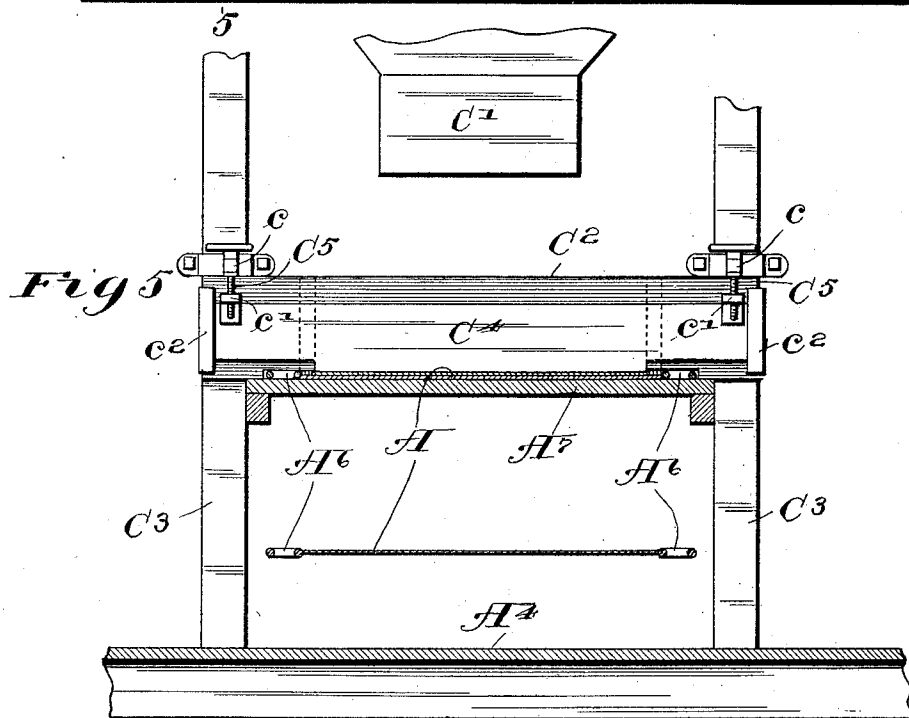
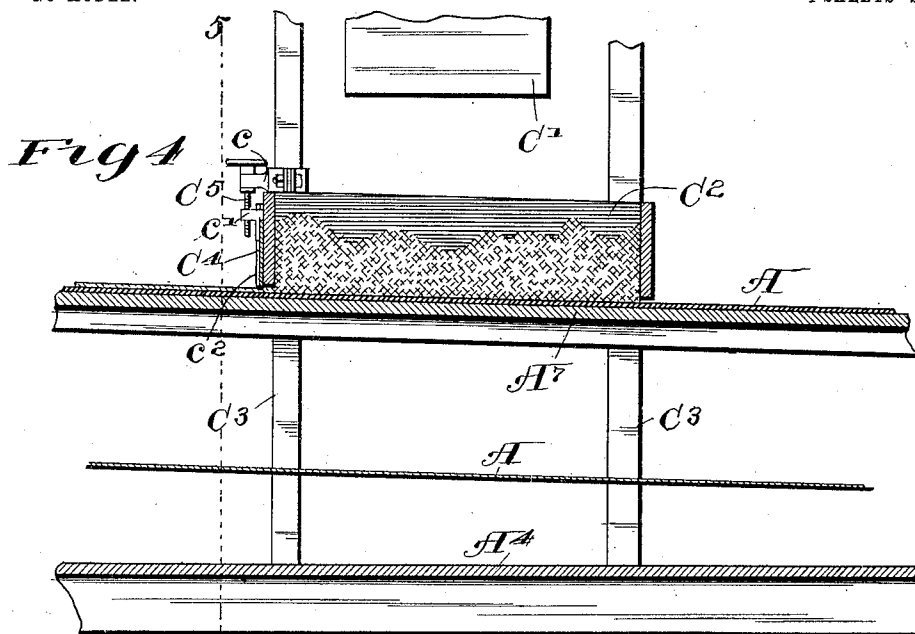
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4 SHEETS—SHEET 3.



Witnesses:

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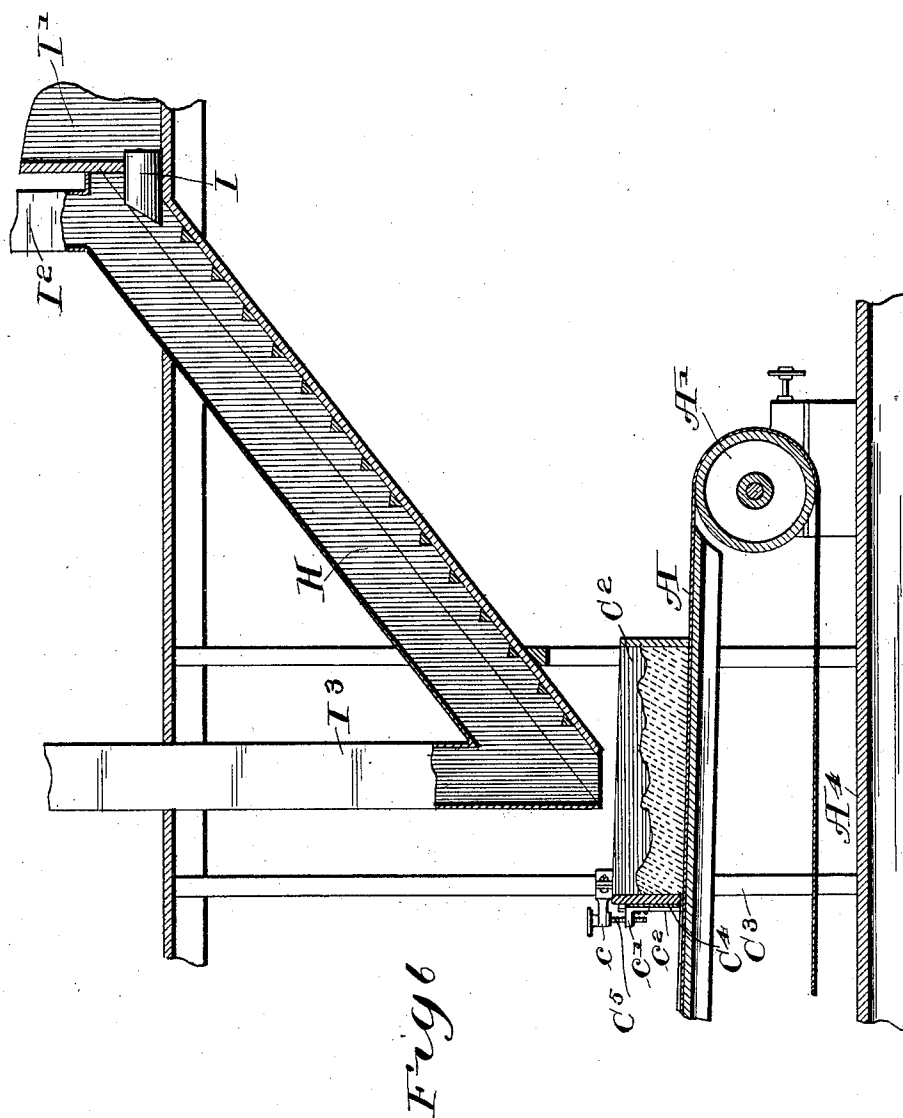
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NO MODEL.

4 SHEETS—SHEET 4.



Witnesses:

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UNITED STATES PATENT OFFICE.

WILLIAM M. MORSE, OF CHICAGO, ILLINOIS, ASSIGNOR OF TWO-THIRDS
TO LEWIS R. SPEARE AND EDWARD R. SPEARE, OF BOSTON, MASSA-
CHUSETTS.

PROCESS OF MAKING CHIP-SOAP.

SPECIFICATION forming part of Letters Patent No. 752,573, dated February 16, 1904.

Application filed April 10, 1903. Serial No. 152,012. (No specimens.)

To all whom it may concern:

Be it known that I, WILLIAM M. MORSE, of Chicago, in the county of Cook and State of Illinois, have invented certain new and useful
5 Improvements in Processes of Making Chip-Soap; and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, and to the letters of reference
10 marked thereon, which form a part of this specification.

This invention relates to a novel process of manufacturing chip-soap or soap which has the form of small thin cakes and such as readily
15 dissolves in water when used.

The invention consists in the matters hereinafter set forth, and more particularly pointed out in the appended claims.

In practicing my novel process to produce
20 chip-soap I proceed generally as follows: The saponified material in a suitable consistency for spreading and retaining its spreaded form is spread or transformed into a continuous layer or web equal in thickness to the pieces
25 or chips to be made and so thin as to be readily dried, and the layer or web is then subjected to the action of a drying agent—as, for instance, it may be spread on a traveling carrier and moved slowly forwardly by the carrier through or in a suitable drying-chamber,
30 through which chamber a current of air is passed until a large percentage of the moisture is removed therefrom and the layer assumes a dry and brittle form. Thereafter the dried
35 layer of soap is divided into small pieces or cakes of commercial sizes. If the saponifying process takes place under such high temperatures that the saponified material as it leaves the saponifying-vat is of too soft a consistency to retain its form on the carrier after
40 being spread thereon, said soft or semiliquid material may be preliminarily chilled and dried in any suitable manner before it reaches the carrier to be spread thereon. For instance, said material may be chilled by passing the same over a series of inclined or descending riffles, whereby when the soap
45 reaches the spreading device it is chilled and

dried to a proper consistency to maintain the form given thereto on the carrier by the
50 spreader.

I have shown in the drawings a convenient and practical apparatus for carrying out my process, though it will be understood that such
55 apparatus may be widely varied in its structural details, while retaining the features which are necessary to a successful practice of my process.

As shown in said drawings, Figure 1 is a horizontal sectional view of an apparatus de-
60 signed for carrying out my novel process, taken on line 1 1 of Fig. 2. Fig. 2 is a longitudinal vertical section thereof with parts broken away. Fig. 3 is an enlarged longitudinal section of the rear end of the apparatus
65 shown in Figs. 1 and 2. Fig. 4 is an enlarged detail section taken on line 4 4 of Fig. 1. Fig. 5 is a section taken on line 5 5 of Fig. 4. Fig. 6 illustrates a modified means for delivering the saponified material from the saponifying-
70 vat to the belt or carrier.

As shown in said drawings, A designates an endless carrier or belt trained about rollers A' A² at the front and rear end, respectively, of the apparatus. The belt is driven
75 through the medium of a horizontal rotative shaft B at the rear end of the machine, which is mounted in suitable bearings b, mounted on standards A³, rising from the floor A⁴ of the
80 apartment containing the apparatus. Said shaft is provided with a beveled gear-pinion B', which meshes with a beveled gear-wheel A⁵, which is fixed to the shaft of the rear roller A². Said shaft B is given rotation
85 through the medium of a belt-pulley B², as shown in Fig. 1. The belt A is made of canvas or like material and is provided at its margin with sprocket-chains A⁶ A⁶, which engage
90 sprocket-teeth at the ends of the rollers A' A², whereby said belt is positively driven. The upper lap of the belt is supported by a horizontal platform A⁷, which extends from end to end of the apparatus, whereby said upper
95 lap is prevented from sagging by the weight of the superposed layer of soap.

C designates a saponifying-vat located over

the front end of the apparatus and in which the material from which the soap is made saponified. The contents of said vat is discharged therefrom through a spout C' at the lower side thereof into a chamber C², located immediately above said belt and which is supported on standards C³ C³, rising from the floor A⁴. The bottom of said chamber is formed by the belt A, and the saponified material is discharged directly upon the belt and is merely confined by the side walls of said chamber for the purpose of properly spreading it upon the belt in the manner hereinafter to be described.

The saponified material in the chamber C² is herein shown as spread upon the traveling belt or carrier A by a spreading device, which is made as follows: The front wall of the chamber C², or that toward the direction of travel of the belt, terminates at its lowest margin short of the belt, so as to leave a transverse slot at the forward end of the chamber C², through which the material spread on the belt may pass. The thickness of the layer of saponified material which is allowed to pass from the chamber on the belt is determined by the vertical width of the slot. In order to be able to vary the thickness of the layer, I have provided a vertically-movable gage-plate C⁴, which is located outside of the front wall of the chamber and which fits flat thereagainst and extends at its lower edge somewhat below the lower edge of said front wall, so that the lower margin of said plate constitutes the upper line or boundary of the spreading-slot. Said plate C⁴ is vertically adjustable by means of two screw-shafts C⁵ C⁵, located one at each end of the front wall of the chamber and rotatively mounted in brackets c, supported on the standards C³. Said screw-shafts have screw-threaded engagement with apertured screw-threaded lugs c', extending forwardly from the upper margin of said gage-plate C⁴. Said gage-plate has guiding engagement at its end with vertical guides c'', attached to the forward wall of the chamber adjacent to the posts C³. With this construction it will be obvious that the depth or thickness of the layer of the saponified material spread upon the belt or carrier may be varied by raising or lowering the gage-plate, as desired.

The saponified material after being spread upon the belt A in the manner described is subjected to the influence of a drying agent, such as air in motion, and, as herein shown, the material is carried after being spread on the belt through a drying-chamber D, which is located over the belt and fits closely thereto, so as to prevent the escape of any considerable volume of air between the same and the belt. Said drying-chamber D is supplied with air from a fan-blower D', which is supported on standards d, rising from the ceiling of the chamber or apartment in which the ap-

paratus is located. Said drying-chamber D is made of a sufficient length to properly dry the material which is passed slowly there-through on the belt, the speed of the belt being proportioned to the length of the chamber and the amount of moisture to be removed from the material. The air after absorbing the moisture from the layer of soap or saponified material on the belt is discharged from the drying-chamber through an education-pipe D², which leads outside of the building. Said layer of saponified material is subjected to the influence of the drying agent until it is practically dry and hard enough to store, and it is not ordinarily necessary to subject the same to a subsequent drying process, though in some instances in the manufacture of certain grades of soap it may be desirable to subject the soap to a further drying process.

After the soap has been dried in the manner described it is divided into parts or cakes of convenient size for handling and use. A practical manner of dividing or separating the layer of soap into a number of parts or chips is herein shown, which consists of a rotary cutter E, which is mounted in suitable bearings e, contained in pillow-blocks E', one at each side of the frame, as shown in Figs. 1 and 2. Said rotary cutter is provided with longitudinal and transverse circumferential cutting-blades, whereby the layer of soap as it passes thereunder is divided into a plurality of rectangular or other shaped pieces. The said bearings e are free to rise and fall in the pillow-blocks E', and the weight of the roller is supported directly on the belt, so that the blades of the cutter, which need not be very sharp, have a free cutting action with respect to the layer on the belt. Said cutter is driven from the sprocket-chains of the belt A through the medium of sprocket-wheels E³ on the ends of the cutter, which mesh with said sprocket-chains.

The divided pieces of soap after being discharged from the belt A may be disposed of in any suitable manner, and if it is not required to submit the same to a further drying process the soap may be discharged from a chute F at the rear end of the machine and from thence to a suitable storage-receptacle G, placed there to receive the same. Again, the chips or pieces of soap after being discharged from the belt A may be carried backwardly to the front of the machine, as shown in my copending application for United States Letters Patent, Serial No. 152,013, filed of even date herewith, and on the return of the chips they may be subjected to a further drying action.

In the practice of my process the saponified material is continuously discharged from the saponifying-vat into the spreading-chamber C². In instances where the saponification takes place under low temperatures the saponified mass may be deposited directly into said

chamber from the saponifying-vat; but where saponification takes place under high temperatures it may be desirable to preliminarily harden the material before it is discharged upon the belt in the manner before stated. Such preliminary hardening of the saponified material may be effected by allowing the same to pass by gravity from the saponifying-vat over a rifflled surface to the spreading-chamber C², as shown in Fig. 6. Such a rifflled surface is shown as formed on the bottom of an inclined chute or conduit H, into the upper end of which is discharged through a pipe I liquid saponified material from the saponifying-vat I'. The bottom wall of said chute or conduit is formed with a plurality of transverse ridges, which constitute the rifflled surface. The lower end of the chute or conduit discharges into the spreading-chamber C². Air is forced through the chute or conduit I through a branch I² at the top thereof, and a portion of said air is drawn off from the chute through an upwardly-directed branch I³, leading from the lower end of the chute. The air passing over the saponified mass, broken by the rifflled surface, hastens to chill the heated and liquid mass, so that when it reaches the spreading-chamber it is in condition to be spread upon the belt and retain its spreaded form.

In the use of either manner of delivering the material to the belt the mass as it is deposited on the belt in said spreading-chamber adheres to the belt, and as the belt travels forwardly beneath the chamber the mass tends to be carried forward thereby; but only a thickness or layer thereof equal to the width of the slot between the gage-plate and belt may pass from said chamber, said gage-plate acting to define or determine the thickness of the layer which is carried forwardly thereby to be dried. As the belt advances the layer of soap thereon becomes set or hardened by contact of the air between the spreading-chamber and the drying-chamber. During the passage of the belt and the superposed layer of the soap through the drying-chamber the layer is subjected to the draft of air forced through said chamber by the fan D', and the moisture from said soap is absorbed by said air and is carried away therefrom and from the chamber through the pipe D². As before stated, the belt A is preferably made of canvas or like material, so that some of the air which is forced into the drying-chamber passes through the body of the soap and through the belt, and thereby admits of a more intimate commingling of the air and soap mass and facilitates the drying thereof to a greater extent than would be true if the belt were made of a solid impervious material. The speed of the belt A is preferably so timed with respect to the length of the drying-chamber that when the layer of soap has been carried through said belt the soap

will be sufficiently dry to be cut up into the desired-sized cakes and stored. As the dried layer of soap emerges from the drying-chamber the rotary cutter acts thereon to divide the same into desired-sized cakes, and said soap is discharged from the belt into the chute F, placed there to receive the same and direct the soap chips into the storage vessel G.

Instead of employing the apparatus herein illustrated I may employ the apparatus shown in Figs. 9 and 10 of my copending application, hereinbefore referred to, wherein the saponified mass is dried while spread upon the periphery of a rotary drier, which latter is contained in a chamber through which drying-air is forced.

By the practice of the process herein described I am enabled to greatly simplify and cheapen the cost of producing chip-soap. It has heretofore been a common practice in the manufacture of chip-soap to harden the saponified material in large pieces or lumps and to thereafter gradually subdivide the same into smaller pieces while subjecting each subdivision for long periods of time to the drying influence of the atmosphere or kiln-dried air, and finally reducing the same to the ultimate or commercial sizes and subject the same to a final drying operation in a drying-chamber, the chips being carried through said chamber by means of a series of suitable carriers. The practice of such prior process necessarily involves considerable time in the production of the soap, large storing-space for storing the same while drying the subdivided pieces, and an extensively-equipped and complicated drying-chamber for drying the soap after it has been reduced to its final size. In my process, on the other hand, the drying of the soap and its subdivision takes place in a single cycle of operation of the machine, thereby saving not only a great amount of time, but also the expense attendant upon the storage of the soap while drying, rendering a large storage-house and drying apparatus unnecessary and lessening the work of subdividing the soap in accordance with said prior process.

I claim as my invention—

1. The process of producing chip-soap which consists in transforming a mass of plastic saponified material into the form of a continuous layer or web equal in thickness to the pieces or chips to be made, subjecting such layer or web to the action of a drying agent to effect the drying of the material while still in the form of such continuous layer or web, and finally dividing the dried layer or web into small pieces or chips.

2. The process of producing chip-soap which consists in chilling the heated saponified material to render the same less fluid, transforming the saponified material into the form of a continuous thin layer or web, equal in thickness to the pieces or chips to be made, sub-

jecting such layer or web to the action of a
drying agent to effect the drying of the mate-
rial while still in the form of such layer or
web, and finally dividing the dried layer or
5 web into small pieces or chips.

In testimony that I claim the foregoing as
my invention I affix my signature, in presence

of two witnesses, this 18th day of March, A. D.
1903.

WILLIAM M. MORSE.

Witnesses:

WILLIAM L. HALL,
GEORGE R. WILKINS.