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[54] **PUTTY CONDITIONING METHOD AND APPARATUS**

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[58] **Field of Search** 259/185, 186, 191, 192, 259/193, 9, 10, 97; 99/467, 473, 470, 474

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[57] **ABSTRACT**

An improved method and exemplary apparatus for plasticizing applique putty materials to a workable state in which normally solidified masses of putty, used in ornamenting picture frame mouldings and the like, are heated on open racks in a live steam chamber. The solidified putty melts in the hot wet atmosphere and gravitationally drips into a hopper communicating with a mixing screw conveyor which agitates and blends the putty into a homogeneous plastic mass for discharge thereby through a gate as needed.

7 Claims, 3 Drawing Figures

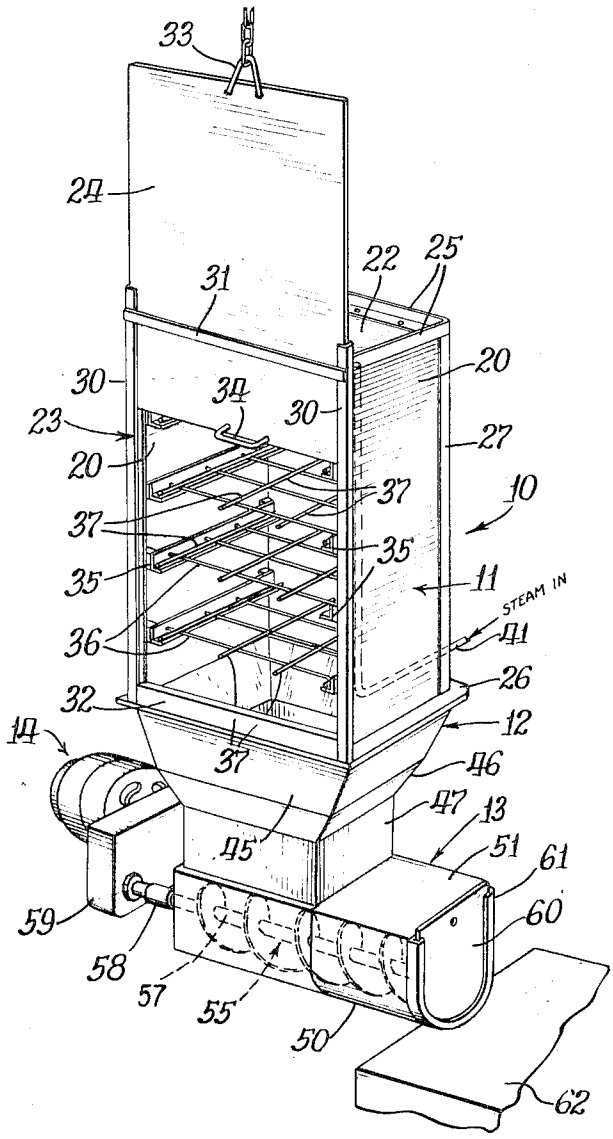


Fig. 1.

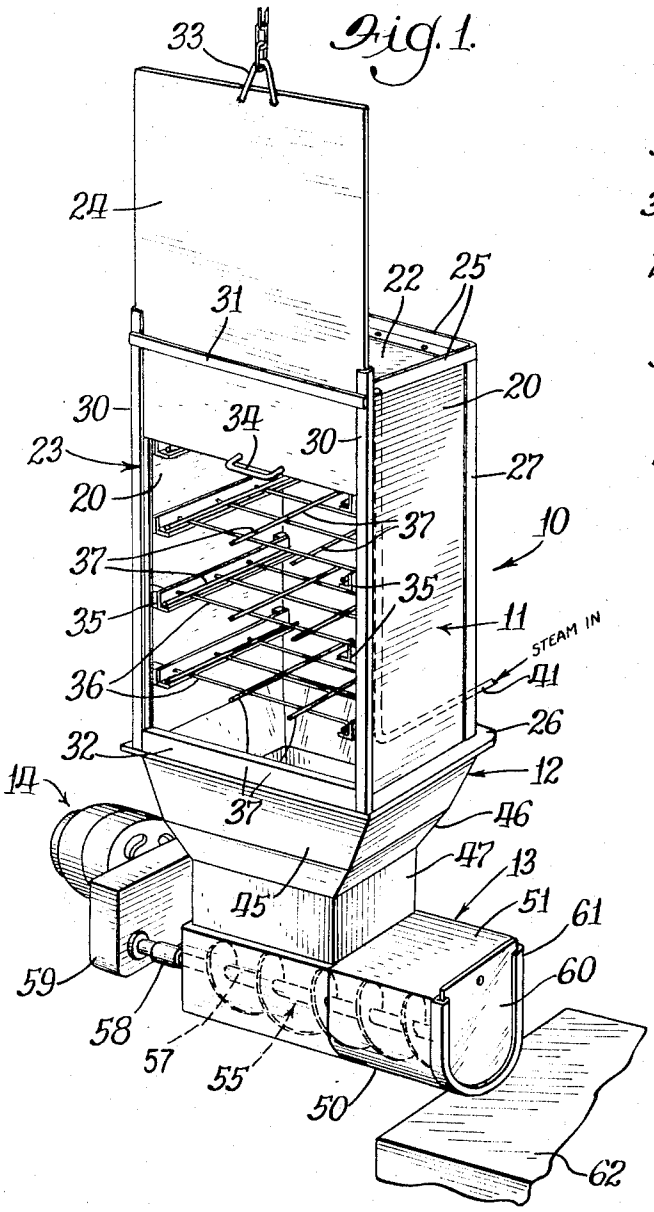


Fig. 2.

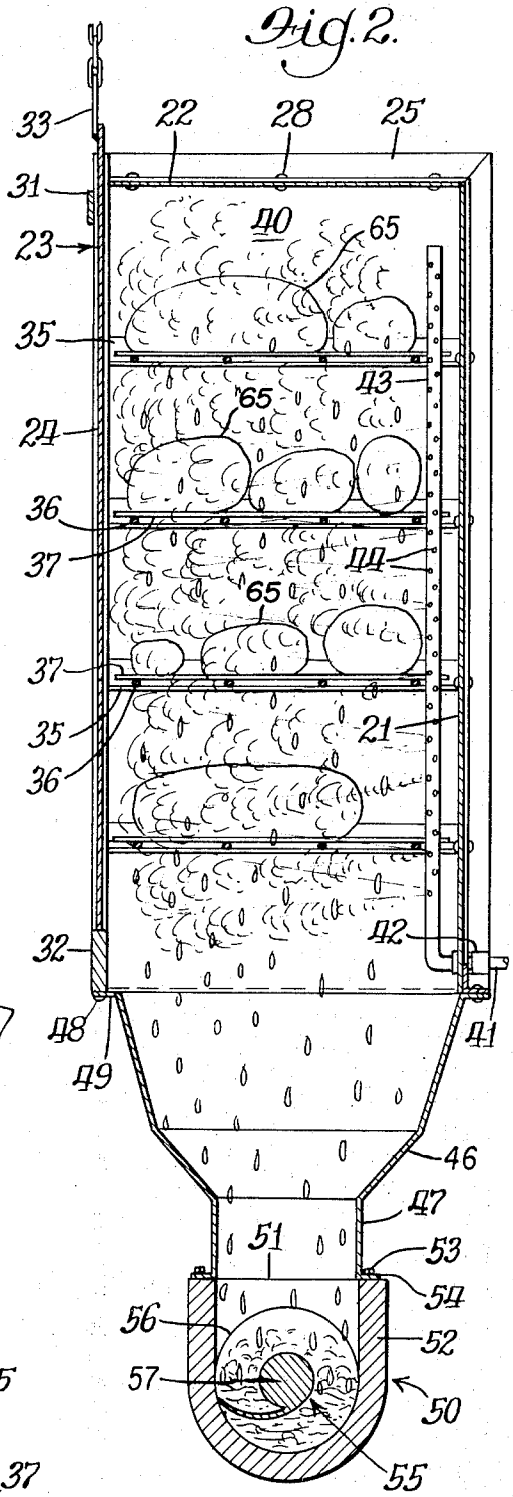
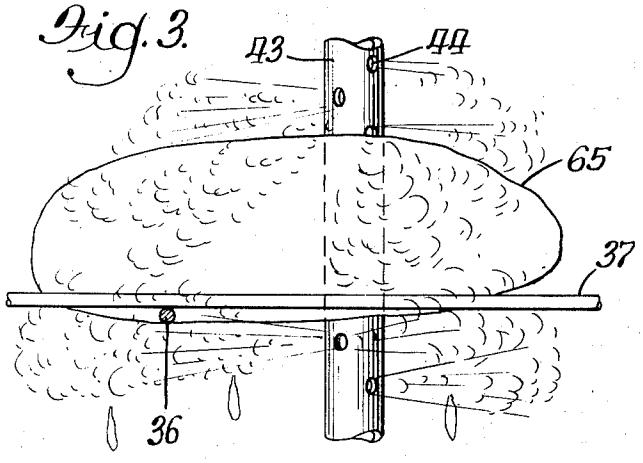


Fig. 3.



PUTTY CONDITIONING METHOD AND APPARATUS

BACKGROUND OF THE INVENTION

This invention relates generally to the art of making ornamental moldings and appliques and more particularly is directed to an improved process and apparatus for work-conditioning solidified applique materials used therein.

According to the time honored art of manufacturing ornamental picture frame moldings and/or appliques therefor, it is usual practice to apply plasticized glue putty directly to the surface of wooden moldings by squeezing a ribbon thereof beneath a rotating die wheel so that the putty is applied and shaped to a desired ornamental relief which provides a decorative surface on the wooden molding. In the case of making ornamental applique independently of the wooden strip, the same general procedure is followed except that the ribbon of putty is usually deposited onto a moving belt conveyor and formed beneath a rotating die wheel having a desired relief design engraved into its periphery. In either case, when the putty is cool, it becomes stable and hard and in the case of applying the same directly onto wood moldings for instance, strongly adheres thereto.

In accordance with recognized practice, the applique material for the above purpose is periodically prepared in a batch mixer and generally comprises a mixture of powdered ingredients, such as rosin, glue and whiting plus suitable dryers and liquid carriers to produce a raw putty material of bread dough consistency. After the initial compounding of the mixture, the putty is divided or cut into smaller bats or balls, usually in the order of 50 to 100 pounds weight, and permitted to set and harden until required for production of ornamental moldings or relief appliques.

Before the hardened putty balls may be utilized in the ornamental molding process, as above briefly outlined, it is first necessary to plasticize the same into a workable condition. By present procedure this is carried out in large steam ovens by placing several bats or balls of putty into one or more shallow pans and heating the same in a wet steam atmosphere until the putty material is pliable. The heavy and cumbersome pans of plasticized or melted putty are then removed from the ovens and the melted putty poured into the feed hopper of a die forming machine for further processing into ornamental framing or applique strips, as the case may be. Unfortunately, such pan steaming of the putty balls does not provide uniform heating of the putty material. To the contrary, all too often the exterior skin portions of the putty balls are overheated and over liquified from the wet steam atmosphere while the interiors thereof remain relatively cool, hard and dry. Consequently, as now practiced it is necessary to continue heating the balls until the interiors thereof have reached a proper workable temperature and consistency. In carrying this out, great skill and care must be taken during the cooking procedure, or it is possible to burn or overheat the exterior putty layers. In the case of the overheated material, the same must be cooled to a proper temperature before being fed into the die forming machine. If the putty is burned, however, it must be discarded. All in all, such present practice is not satisfactory since among other drawbacks, it produces non-homogeneous heating of the putty material,

is time consuming and depends largely on the skill of the operator or cook.

The improved process and apparatus of the present invention are directed to the alleviation and avoidance of the above outlined problems.

SUMMARY OF THE INVENTION

In brief, the present invention contemplates an improved process for plasticizing putty materials used in ornamenting picture frame moldings and the like involving the steps of heating solidified glue putty balls on open racks in a live steam atmosphere whereby the exterior layers thereof are gradually melted and uniformly heated, collecting the melted materials in a hopper and mixing the same to a homogeneous mass which is constantly circulated and mixed until required for use. The improved equipment for carrying out this procedure comprises a steam oven having a plurality of vertically spaced open racks for supporting putty balls directly thereon, a hopper means positioned below the oven and communicating openly with the interior thereof for receiving the melted putty which falls and drops from the overhead racks, and agitating means communicating with the hopper means and operable to mix the materials to uniform consistency and subsequently convey the same through a selectively operable discharge gate for use in the die forming process.

One of the objects of this invention is the provision of an improved procedure for conditioning normally solidified materials to form a plasticized mass therefrom useful in applique decoration.

Another object of this invention is to provide an improved process for plasticizing glue putty and like materials useful in the art of making decorative picture frame moldings and the like by which consistent uniformity of mixture and plasticity of the putty is achieved.

Still another object of this invention is to provide an improved combination heating and mixing apparatus for melting, moisturizing and mixing normally solid applique materials into a plasticized homogeneous mass for die cutting application thereof in the art of making decorative picture frame moldings.

A still further object of this invention is to provide an improved heating and mixing apparatus as set out in the preceding object having the capability of agitating and storing a homogeneous mass of the plasticized material for periodic discharge of selected quantities thereof over prolonged time intervals.

Having thus described this invention, the above and further objects, features and advantages thereof will appear to those of skill in this art from the following description of a preferred embodiment thereof presently conceived to be the best mode for teaching the use and practice of this invention.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. **1** is a perspective showing of heating and mixing apparatus embodying the features of this invention;

FIG. **2** is a longitudinal cross-sectional view thereof; and

FIG. **3** is an enlarged partial view in side elevation illustrating the process of heating and melting solidified putty balls in the apparatus of FIGS. **1** and **2.**

DESCRIPTION OF THE PREFERRED EMBODIMENT

Turning first to the specifics of the exemplary apparatus **10** illustrated in the drawings, it will be appreciated from FIG. **1** in particular that the same comprises a substantially vertically upright heating oven means **11** built as a generally parallelepiped structure, a hopper means **12** communicating with and closing over the bottom of the oven means **11** and an agitator conveyor means **13** in receiving relationship with the hopper means **12** including power drive means **14** therefor.

With specific reference now to the structural aspects of oven means **11**, it will be appreciated and understood that the same comprises a pair of parallel spaced rectangular side walls **20, 20**, an enclosing back wall **21**, a rectangular top wall **22** and a front wall **23** with removable access door member **24**. Channel iron frame members **25** and **26** are provided at the upper and lower margins, respectively, of the side and back walls to cooperate with vertical angle iron side frame members **27** (see FIG. **2**) to support the two side walls, back wall and top wall; the walls and frame members being interjoined as by welding, rivets, or similar connective means **28** in conventional fashion as best illustrated in FIG. **2** of the drawings. Two U-shaped rail frame members **30, 30** transversely border the front lateral margins of the two side walls **20, 20** while cross bracing frame members **31** and **32** intertie such U-shaped rail members near their upper and lower ends to provide a rigidified frame structure.

The planar front closure member **24** is adapted to slide in the opposing open channels of the two rail members **30, 30** for vertical raising and lowering movements as by hoist means (not shown), attachable to the upper margin of the closure member via hook means **33** engaged in suitable openings in the upper margin of the door panel **24**. A manual engageable handle means **34** is optionally provided adjacent the lower margin of the door **24** to assist the operator in manually raising or lowering the door if desired.

Mounted on the inside of walls **20, 20** are a plurality of parallel inwardly projecting L-shaped rails **35, 35** disposed at vertically spaced intervals and in opposing pairs to support open racks made up of rod elements **36** and **37**. The rod elements **36** extend between pairs of the rails **35** and are welded to transversely related rod members **37** to form open grid racks. Preferably such racks are removable from the supporting rails **35, 35**. In the particular embodiment illustrated (see FIG. **2**) four such racks are provided in vertical spaced arrangement within the hollow interior or chamber **40** of the oven means **20**, however, it will be appreciated that the number of racks and the volume of the oven chamger is a matter of design choice.

Supported on the back wall **21** of the oven means is a steam inlet pipe **41** held by bracket means **42** and operationally joined to a source of live wet steam in the order of 250° F. at 125 PSI. Extending upwardly from the steam inlet pipe **41** is a steam distribution pipe **43**, supported parallel to the back wall **21** of the oven and provided with a plurality of staggered or spaced openings **44** for supplying live steam into the interior chamber **40** of the oven, the purpose of which will appear in greater detail hereinafter.

If desired, suitable steam pressure and temperature gauges (not shown) may be provided on the oven means for monitoring the atmosphere within the oven chamber **40** in accordance with known skill of the art.

Mounted over and enclosing the bottom end of the oven means **20** and disposed directly beneath chamber **40** is the hopper means **12** having sloping side and end walls. In the particular embodiment shown, each of the hopper walls is formed with steep and shallow inclined sections **45** and **46**, respectively, formulated to provide a substantially truncated pyramid formation. A discharge throat, comprising a rectangular shaped chute **47**, communicates directly with the lower truncated end of the hopper means formed by wall portions **46**, being rigidly joined thereto with sealed connection as by welding or integral formation.

It will be understood and appreciated that the hopper means **12** is specifically provided to collect materials discharged from the oven chamber **40** and to guide such materials downwardly under the influence of gravity flow into the throat portion **47**. Connection between the hopper means **12** and the lower end of the oven **20** is effected by any suitable means such as bolts, rivets or the like **48** extending between a lower skirt flange formed by frame members **26** and an outwardly turned flange lip **49** bordering the upper end of the hopper wall portions **45** (see FIG. **2**). While the wall portions **45** and **46** of the hopper are herein illustrated as having a double or compound formation to down-feed the ingredients received therein, such wall portions may be made with a single slope angle if desired without violating the intents, purposes and functions of the hopper means.

Mounted transversely across the lowermost end of the chute portion **47** of the hopper means is the agitator and conveyor means **13**, comprising an elongated housing **50** of generally U-shaped cross-section (see FIG. **2**), formed by an enclosing upper wall **51** and a curvilinear side wall **52**. As shown in FIG. **2**, the side wall **52** is of relatively thick dimension. Plural bolt fastener means **53** are employed for attaching the means **13** to the lower flanged end **54** of the hopper throat portion **47** adjacent or over one end of a screw conveyor means **55**. The conveyor **55** extends lengthwise of the elongated housing **50** and comprises a helical flight member **56** fixed to a central shaft **57** which extends through the left hand or one end wall (see FIG. **1**) of housing **50** via a bearing journal (not shown). Additional bearing support for shaft **57** is provided by virtue of attaching the outer end of such shaft to coupling **58** associated with a reduction gear means **59** driven by a drive motor means **14**.

The right hand end or other end wall **60** of the housing **50**, as best shown in FIG. **1**, comprises a vertically slidable gate supported on a channel frame member **61** so that the gate wall **60** may be raised manually, or by use of a chain hoist attached thereto when it is desired to permit the rotating screw conveyor to push or discharge materials outwardly onto a loading table **62** or the like.

Having thus described the structural details and particulars of the oven means, hopper means and agitator conveyor means, their use and operation in carrying out the procedural steps for plasticizing a normally rigid glue putty in accordance with the present invention, will now be set forth.

As shown best in FIGS. **2** and **3**, a plurality of putty balls or bats **65** are placed on the open racks in the

oven chamber **40.** As noted previously, the putty balls resemble a large loaf of bread dough which has hardened and must be softened for use in the die ornamenting machine. Once the racks are loaded with bats or balls the door **24** of the oven is lowered from its FIG. **1** position to that illustrated in FIG. **2** enclosing the oven chamber **40.** Live steam is then admitted to chamber **40** via the steam inlet and distribution pipes **41** and **43,** saturating the interior atmosphere of chamber **40** with moist steam. As the hardened putty balls take up the moisture and heat, the exterior layers or surface portions thereof melt and drip downwardly through the open racks into the open mouth of the hopper means **12** which communicates directly with the lower end of the oven chamber **40.** The dripping materials eventually flow downwardly over the inclined walls **45** and **46** of the hopper through the discharge chute portion **47** into the underdisposed agitator conveyor means **13** whereat the helical screw means is rotating. The liquified putty material is thereupon mixed by the rotating screw means into a generally homogeneous mass, ideally having a temperature of approximately 110° to 125° F. Depending on the number of putty balls housed in the chamger **40** and the inlet steam temperature, the melting time for the balls approximates 10 to 15 minutes, reducing the balls to the point where they eventually fall into the liquified material in the agitator conveyor even though the core portion thereof may not be totally melted. The agitator conveyor continuously mixes and agitates the putty and eventually provides a homogeneous uniformly mixed mass for working use. In normal operation the live steam is cut off or interrupted about every 15 minutes. The agitator is continuously operated and once the mass in the agitator conveyor housing is mixed to a proper consistency, principally judged by the expiration of time (approximately 10 to 15 minutes from commencing of the heating operation) it is ready for discharge to the table **62.** This latter operation is brought about by lifting gate wall **60** and permitting the helical flight of the screw conveyor to push a selected amount of the putty outwardly onto the table **62** for further processing and feeding into the die forming machines. It is to be noted that the plasticized putty material remaining in the agitator means **13** is recycled and continuously agitated until needed. In the event that the temperature of the discharge putty material falls much below 105° F., steam is again admitted to the chamber **40** to communicate its heat and moisture content directly into the agitator housing for reheating the putty material being mixed and recirculated therein. If the putty becomes too liquid, dry powdered whiting may be introduced to the agitator to take up excess moisture.

With the above described apparatus and procedure the resulting plasticized putty has been found to be of improved uniform quality and plasticity productive of superior formed appliques under the die wheels as previously described. Additionally, with this procedure and the periodic recycling of the steam to maintain the interior of chamber **40** and the material in the agitator heated, it has been found that over cooking of the putty is avoided while providing a continuous supply of ready mixed material in the agitator which is readily available for the die forming operation. In the event the supply in the agitator is reduced to a quantity less than that estimated to meet the use demands, additional putty balls may be placed on the racks, heated and melted for mixture with the previously plasticized material in the agitator conveyor. By limiting the heating or steam cycles to approximately 10 to 15 minute duration and measuring the heat of the discharged material on the table **62,** to maintain a putty working temperature of approximately 105° F., desired fluidity, moisture content and working plasticity of the material may be maintained with minimum skill.

From the foregoing it is believed that those skilled in the art will readily recognize and appreciate the novel advancement of the present invention over previous procedures and apparatus in the art to which it pertains. Obviously, while the present invention has been described in association with a preferred form of apparatus, it is not necessarily limited to the specifics of the equipment hereinabove described, but is susceptible to various changes, modifications and substitutions of equivalents within the defined scope of the following appended claims.

I claim:

1. An improved process for plasticizing hardened glue putty into a workable state suitable for ornamental applique of picture frame moldings and the like, comprising the steps of: supporting hardened balls of putty on open racks within an enclosing chamber, heating and moisturizing said balls within said chamber to melt successively exposed exterior portions thereof, collecting said melted portions, and mixing the same to a homogenous mass while maintaining the same exposed to the moist heated atmosphere of said chamber.

2. An improved process for plasticizing normally hardened putty to form a workable mass thereof suitable for ornamental applique of picture frame moldings and the like comprising the steps of: supporting balls of hardened putty on open racks in an enclosing chamber, surrounding said hardened balls with moist steam at temperatures and for time periods effective to melt the same; gravitationally collecting the melted putty in a common enclosure communicating openly with said chamber while mixing the same to a homogeneous consistency, and periodically discharging portions of the mixed putty from said enclosure.

3. Apparatus for conditioning normally hardened putty to a workable state for the ornamental applique of picture frame moldings and the like, comprising: oven means comprising a vertical enclosable chamber, a plurality of open grid racks mounted within said chamber for supporting a plurality of hardened putty balls therein; means for heating and moisturizing the atmosphere of said chamber to melt said putty balls, hopper means mounted across the bottom end of said chamber and openly communicating therewith for receiving and collecting melted putty, agitator means having a housing coupled to said hopper for receiving melted putty therefrom, means for driving said agitator means to homogeneously mix and circulate said putty therein, and discharge means on said housing operable to cause said agitator means to convey mixed putty therefrom.

4. The invention of claim **3** wherein said means for heating and moisturizing said atmosphere comprises perforated pipe means joined to a source of live moist steam for distributing the latter throughout said chamber.

5. The invention of claim **3** wherein said agitator means comprises a screw conveyor having a rotatably

driven helical flight for mixing said putty and moving the same toward one end of said housing.

6. The invention of claim 5 wherein said discharge means is a slidable wall enclosing said one end of said housing, and means for selectively moving said wall to provide an outlet opening at said one end.

7. The invention of claim 3 and a movable wall on said chamber selectively operable to permit the loading of putty balls on said racks.

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