Dec. 10, 1968 R. J. BROERSMA ET AL 3,415,416

POT DISPENSER WITH MULTIPLE, SIMULTANEOUSLY ACTING AND CIRCUMPOSED DISCHARGE ASSISTANTS

Filed Oct. 31, 1966 4 Sheets-Sheet 1

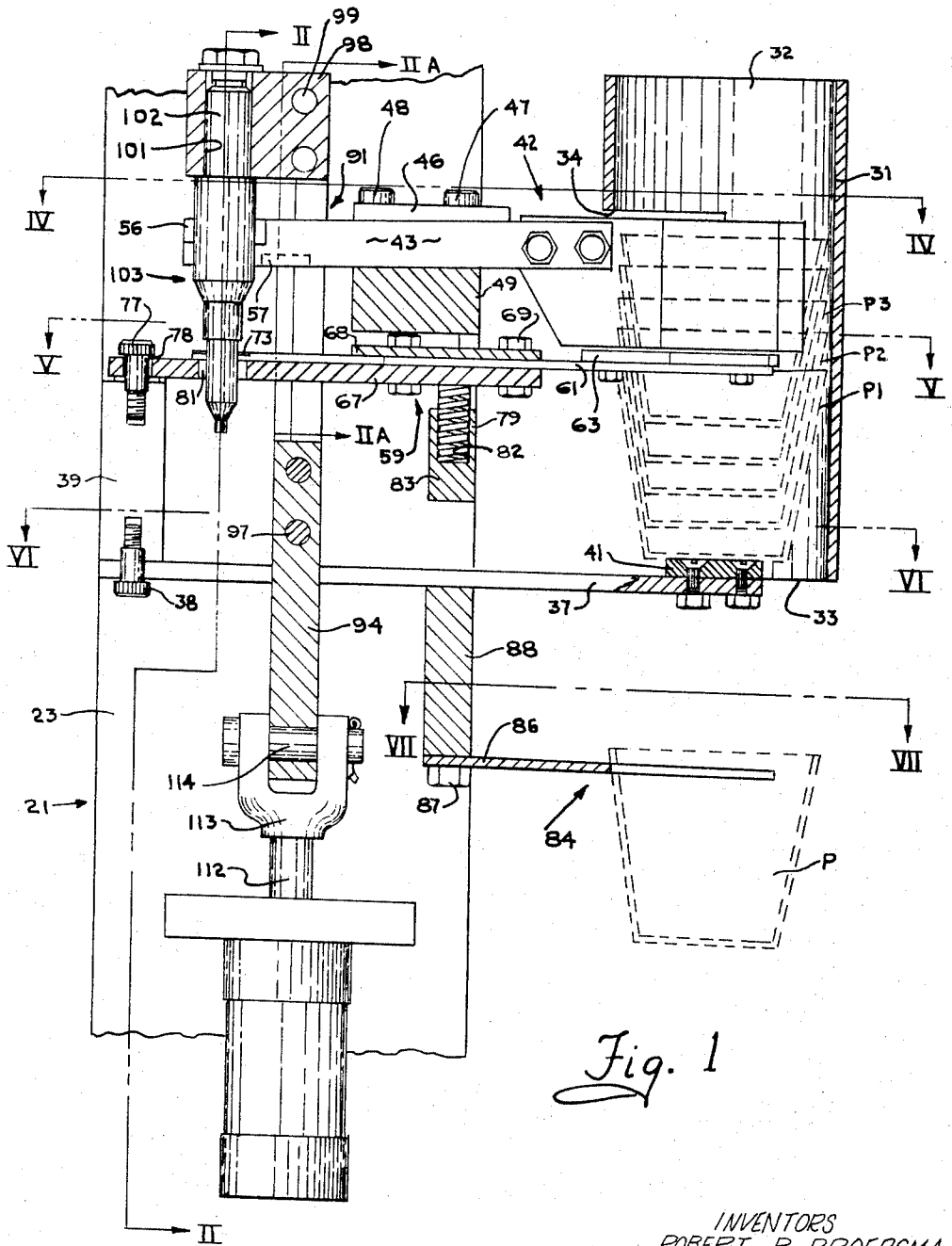


Fig. 1

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4 Sheets-Sheet 2

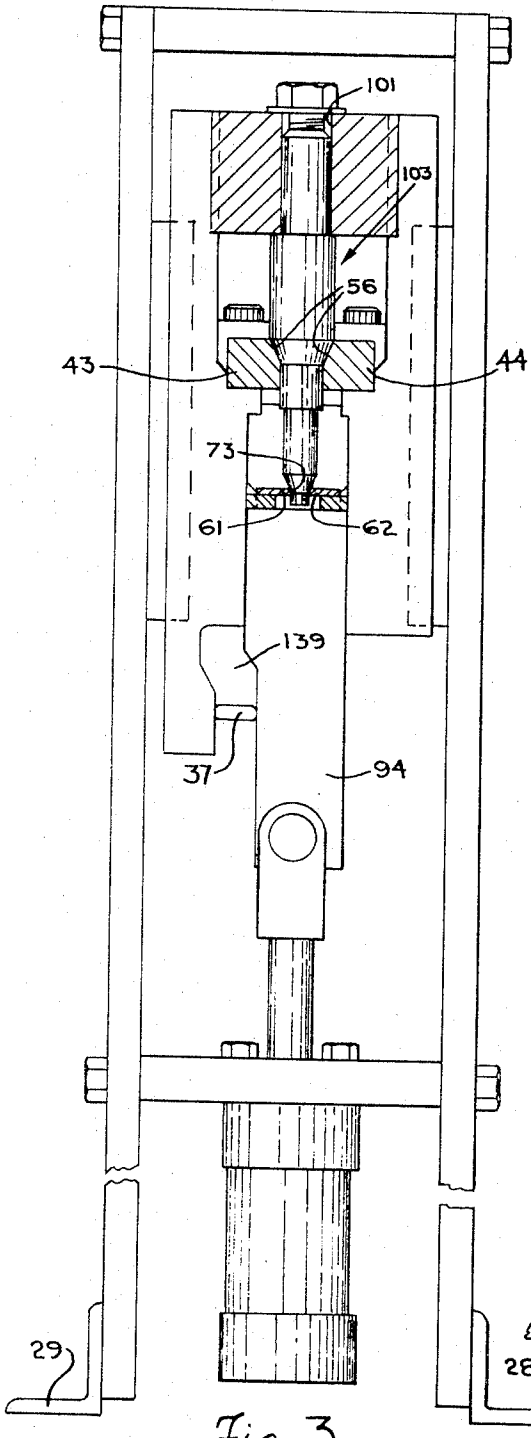


Fig. 3

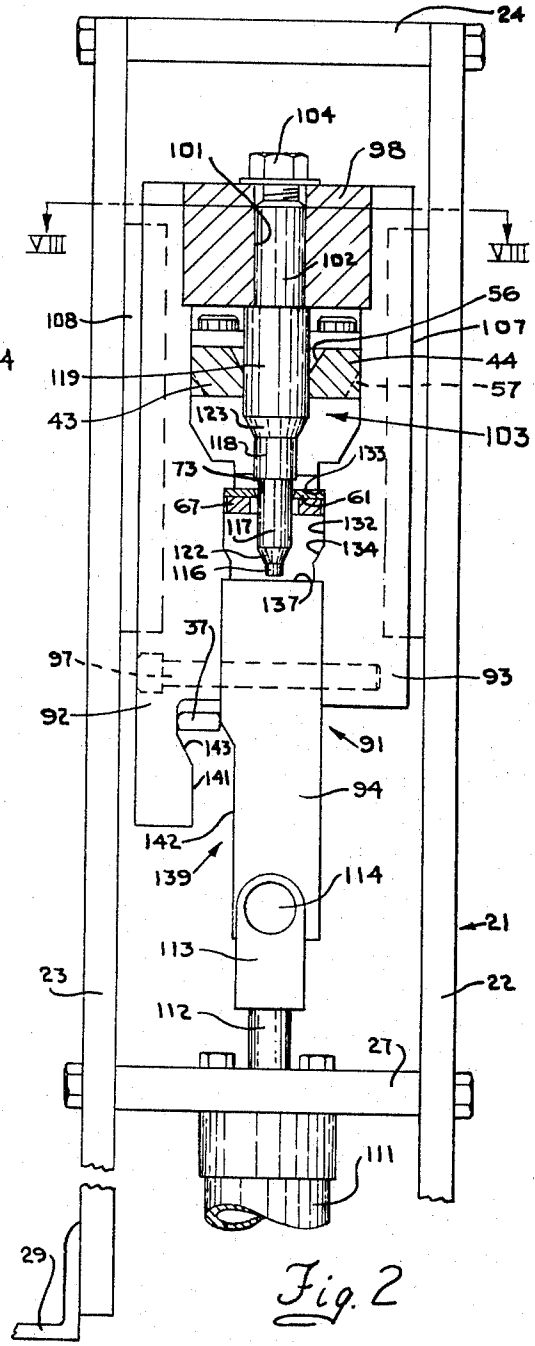


Fig. 2

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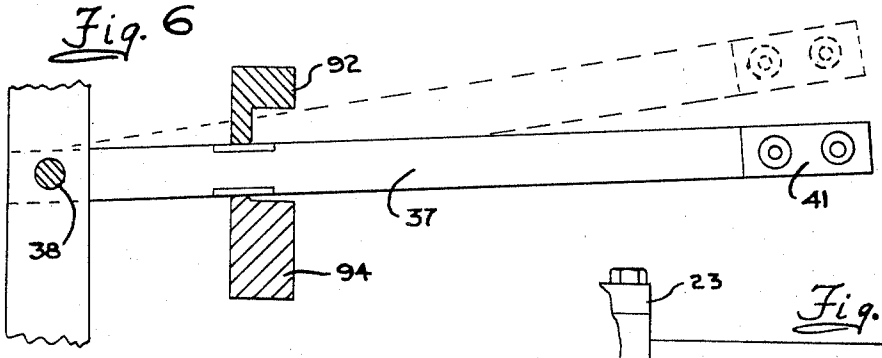
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Filed Oct. 31, 1966

4 Sheets-Sheet 3

Fig. 6



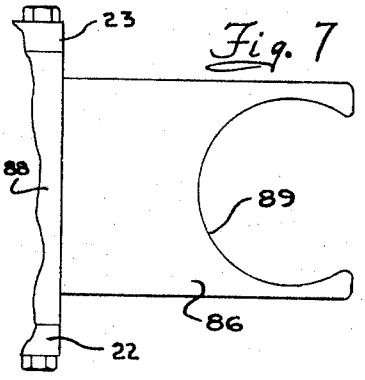


Fig. 7

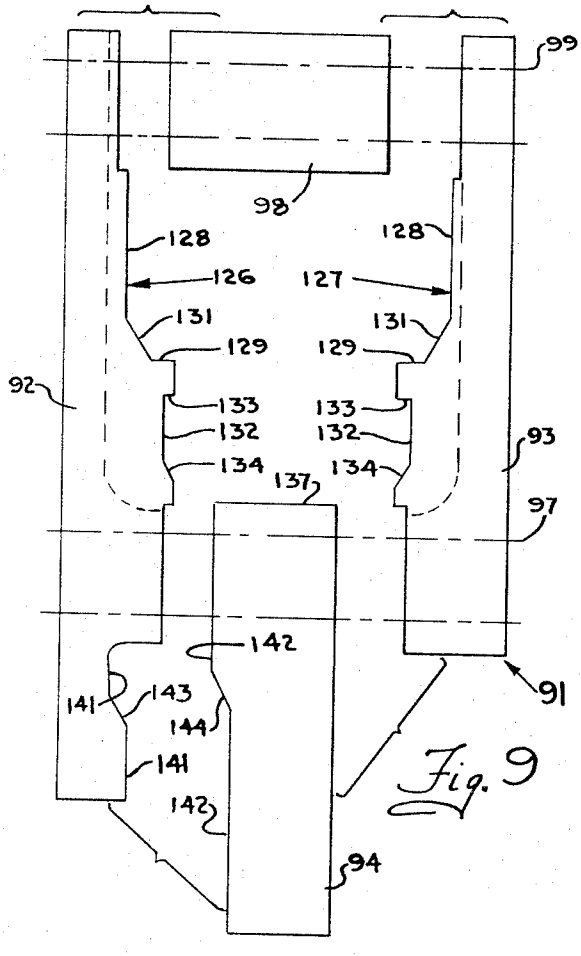


Fig. 9

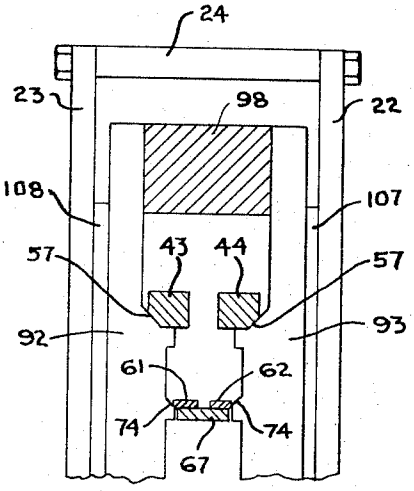


Fig. 2A

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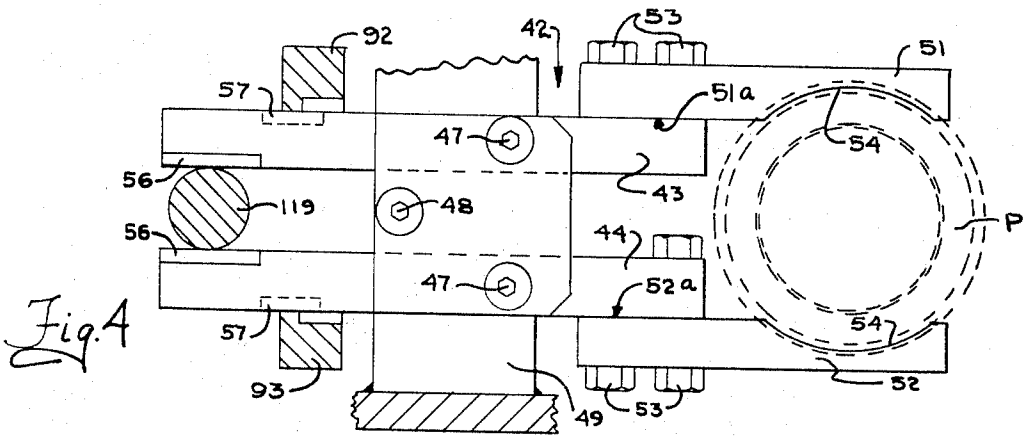


Fig. 4

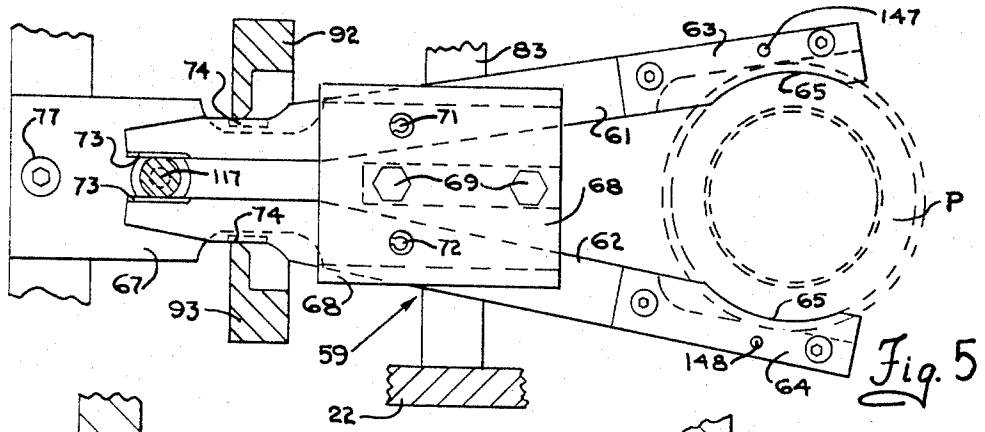


Fig. 5

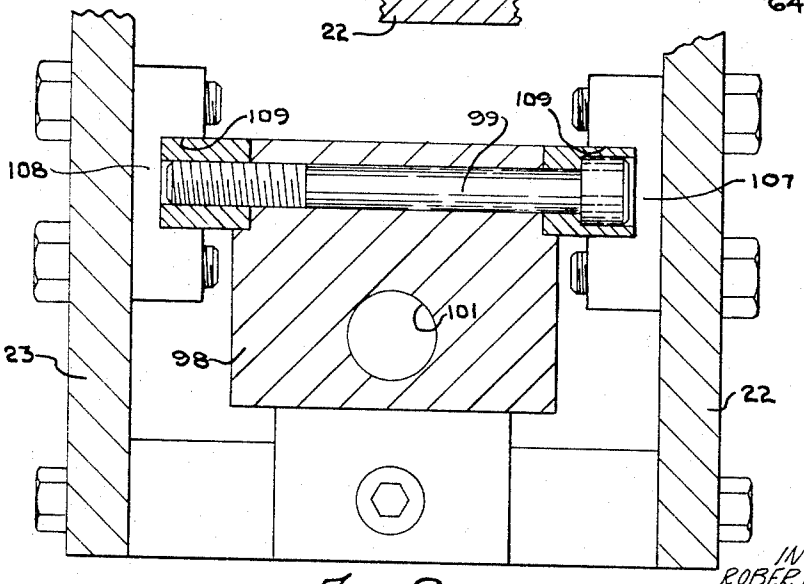


Fig. 8

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3,415,416

POT DISPENSER WITH MULTIPLE, SIMULTANEOUSLY ACTING AND CIRCUMPOSED DISCHARGE ASSISTANTS

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15 Claims. (Cl. 221—221)

ABSTRACT OF THE DISCLOSURE

A pot dispenser having a cylindrical guide tube thereon for receiving and holding a plurality of stacked pots and also having a cam actuated stripper mechanism having fingers which engage the upper edge of the lowermost pot for pushing and separating the same from the stack of pots. The dispenser further has a cam actuated clamp mechanism for holding the stack of pots in position while the lowermost pot is separated therefrom by the stripper mechanism. The fingers of the stripper mechanism are moved vertically to sequentially separate and dispense the lowermost pot from the stack.

This invention relates to a machine for feeding pots to a pot filling machine and particularly to a type thereof adapted for the separation of pots which are stacked together, said machine being especially applicable to those pots which are made from such relatively delicate materials, as paper or compressed peat moss, that they may suffer damage as a result of manual separation thereof.

It has for several years been common practice to sell nursery products in containers made of relatively delicate, disintegrable materials such as compressed peat moss or paper. This has the obvious and well-understood advantage that such nursery products may then be placed directly into the ground without removal from such pot and same will disintegrate and thereby not inhibit the growth of the plant. However, these pots are easily broken. Thus, when they are furnished to a filling table in stacks of several thereof telescoped within each other, they are sometimes separable only with difficulty and may be damaged or completely broken in the separating process. This is particularly aggravated where said pots are being filled on a high-speed basis such as by a number of people sitting on either side of an appropriate filling table and the person assigned to separate the pots has difficulty keeping up with the persons utilizing same.

Accordingly, the objects of the invention include:

(1) To provide a machine capable of separating stacked pots, particularly where same are formed of easily damaged material such as peat moss.

(2) To provide a machine, as aforesaid, which can receive a reasonable number, such as two or three dozen, of such stacked pots and will separate same rapidly and efficiently for successive discharge thereof to a point of use.

(3) To provide a machine, as aforesaid, which, while separating said pots rapidly and effectively, will nevertheless do so without appreciable, if any, damage to same.

(4) To provide a machine, as aforesaid, of efficient and simple construction as to be capable of economical manufacture as well as to be capable of long and effective use with a minimum of maintenance.

(5) To provide a machine, as aforesaid, which will be reliable and uniform in operation.

(6) To provide a machine, as aforesaid, which will be

readily adjustable for handling pots of varying sizes, varying diameters and varying axial lengths.

Other objects and purposes of the invention will be apparent to persons acquainted with apparatus of this general type upon reading the following specification and inspection of the accompanying drawings.

In the drawings:

FIGURE 1 is a side-elevational view, partially broken away and partially in central section, of the pot dispenser according to the present invention.

FIGURE 2 is a sectional view taken along the line II—II of FIGURE 1 showing the actuator mechanism in the retracted position whereby the pot clamps and the stripper fingers are closed.

FIGURE 2A is a sectional view taken on the line IIA—IIA of FIGURE 1 with the parts in the same position as is FIGURE 2.

FIGURE 3 is a sectional view similar to FIGURE 2 but showing the actuating mechanism in an extended position whereby the pot clamps and the stripper fingers are in an open position.

FIGURE 4 is a sectional view taken along the line IV—IV of FIGURE 1 showing the pot clamping mechanism in a closed position.

FIGURE 5 is a sectional view taken along the line V—V of FIGURE 1 showing the stripper fingers in a closed position.

FIGURE 6 is a sectional view taken along the line VI—VI of FIGURE 1 showing the swing arm.

FIGURE 7 is a sectional view taken along the line VII—VII of FIGURE 1 showing the pot catcher on a reduced scale.

FIGURE 8 is a top-sectional view taken along the line VIII—VIII of FIGURE 2.

FIGURE 9 is an exploded view showing the assembly of the cam member for actuating the pot clamping mechanism, the pot stripper mechanism, and the swing arm.

General description

The pot dispenser according to the present invention comprises a frame having a cylindrical guide tube thereon for receiving and holding a plurality of stacked pots and for individually dispensing the same. Also mounted on the frame is a scissor-like pot clamping mechanism having opposed jaws which grip the exterior of the stack of pots for holding the same. Located directly below the clamping mechanism is a stripper mechanism having fingers which engage the upper edge of the lowermost pot for pushing or stripping the same away from the stack of pots. Located directly below the stripper mechanism is a swingable stop member upon which the stack of pots rests upon release of the pot clamping mechanism. The pot dispensing apparatus is automatically operated by means of a slideable cam member which simultaneously coacts with the pot clamping mechanism, the stripper mechanism, and the swingable stop means in the proper sequence for individually separating and dispensing the pots. When the cam member is moved downwardly, the pot clamping mechanism is closed whereby the jaws grip and hold the complete stack of pots except for the lowermost one, while the stripper fingers are also caused to close and lie over the upper edge of the lowermost pot. Further downward movement of the cam member causes the swingable stop to be removed from underneath the stack of pots and causes the stripper fingers to be pulled downwardly, thus separating the lowermost pot from the stack whereby it can then be manually removed by an operator. When the cam member is then moved upwardly, the swingable stop is again cammed into position underneath the stack of pots so as to permit the pots to rest thereon, the stripper fingers and the pot clamping jaws are both opened permitting the stack of pots to fall down

onto the stop member whereby they are in a position for repetition of the previously described cycle. In this manner by continuous up and down movement of the movable cam member, individual pots are continuously separated from the stack of pots contained in the machine and dispensed to a position whereby the operator of the machine can then manually remove the pot for further use.

Detailed Description

In the following description, certain terminology will be used for convenience and reference which will be recognized for convenience only and as not limiting. For example, the terms "rightward" and "leftward" will refer to directions to the right or left as appearing in the drawings in connection with which said terminology is used. The term "upward" and "downward" will refer to directions with respect to the apparatus in its normal position and use. The terms "inward" and "outward" will refer to directions toward and away from the geometric center of the apparatus. Such terminology will also include derivatives of said words above mentioned as well as words of similar import.

Referring to FIGURES 1 to 3, there is shown a frame or base **21** consisting of side plates **22** and **23** which are joined together by a top plate **24** and a bottom plate **27**, the plates being coupled together by any suitable means, such as by bolts or welding. The side plates has attached to the lower ends thereof angle supports **28** and **29** whereby the apparatus can be suitably mounted either on the floor or on any other type of table or support. The frame also has suitably connected thereto a tubular guide member **31** for receiving and guiding a stack of pots. The upper and lower ends **32** and **33** of the tubular guide member are open, the upper end being utilized for loading the apparatus while the lower end is utilized for dispensing pots one at a time. A portion of the lower end of the tube **31** is cut away at **34** to permit the pot clamping mechanism and the stripper finger mechanism to have access to the pots for operation of the apparatus as will be further explained hereinafter.

Mounted on the lower portion of the machine is a swing arm **37** which is connected to the frame of the machine by means of a screw **38** connected to a plate **39**, the plate **39** being fastened to the side plates **22** and **23** and thus forming an integral part of the frame. The swing arm **37** is pivotable about the axis of the screw **38**. Connected to the other end of the swing arm **37** is an adjustment block **41**, the block **41** being connected to the upperside of the swing arm by means of bolts or screws so as to permit ready removal thereof. As shown in FIGURES 1 and 6, the swing arm **37** with the block **41** on the end thereof functions as a stop means for the stack of pots when in one position of operation, the swing arm being pivotable outwardly away from the pots to permit the pots to pass thereby.

Mounted above the swing arm is a scissor-like pot clamping mechanism **42** (FIGURES 1 and 4) which functions to hold the stack of pots while the lowermost pot is being separated therefrom and dispensed. The pot clamping mechanism contains a pair of clamping levers **43** and **44** one lever being the mirror image of the other. The clamping levers **43** and **44** are connected to the frame with the aid of a cover plate **46** mounted thereabove, the cover plate **46** and the levers **43** and **44** being mounted to the frame by means of screws **47** and **48**. The screws **47** and **48** pass through the cover plate **46** and the levers **43** and **44** into a block **49** which in turn is solidly connected to the side plates **22** and **23**, as by welding. The screws **47** each function as a pivot, thus permitting the clamping levers to pivot about the axis thereof in a horizontal plane relative to the frame of the machine. The clamping ends of the levers **43** and **44** are each adapted to have mounted thereon pot clamping jaws **51** and **52** (FIGURE 4), the jaws being connected to the levers by means of screws or bolts **53**. The jaws each have an arcuate gripping surface **54** on the inner side thereof, the surface **54** having a diameter which conforms substantially to the diameter of the pot being dispensed. If it is desired to modify the machine for dispensing pots of other sizes, it is only necessary that the jaws **51** and **52** be removed from the levers and a new set of jaws bolted thereto having a clamping surface **54** of a diameter which suitably conforms to the size of the pot to be dispensed. The other ends of the clamping levers **42** and **43** have tapered camming surfaces **56** formed on the inner upper edges thereof (FIGURE 3). Likewise, the lower outer edges of the clamping levers have similar camming surfaces **57** formed thereon, the purposes of the camming surfaces **56** and **57** being more fully explained hereinafter.

Located intermediate the pot clamping mechanism and the swing arm device is a scissor-like pot stripping mechanism **59**, which mechanism functions to separate the lowermost pot from the remainder of the stack. As shown in FIGURES 1 and 5, the stripper mechanism comprises a pair of stripper fingers **61** and **62**, one finger being the mirror image of the other. Mounted on the outermost end of the fingers **61** and **62** are stripper jaws **63** and **64**, the jaws being bolted to their respective fingers. The inner edges of the stripper jaws **63** and **64** each have an arcuate surface **65** thereon having a configuration which substantially conforms to the shape and size of the pot being dispensed. If it is desired to adapt the apparatus for dispensing pots of other sizes, the stripper jaws **63** and **64** can easily be replaced by removing the screws holding the jaws to the fingers and replacing the jaws with a new set having a configuration which substantially conforms to that of the pot to be dispensed.

The stripper fingers **61** and **62** are mounted between a floating plate **67** and a cover plate **68** by means of bolts **69** passing through the plates **67** and **68**. Similarly, a pair of pivot pins **71** and **72** (FIGURE 5) pass through the central portion of the stripper fingers **61** and **62** with the ends of the pivot pins being mounted or terminating in the plates **67** and **68**, thus permitting the stripper fingers to be pivotable relative to the plates. The upper inner edges of the stripper fingers **61** and **62** have formed thereon camming surfaces **73** on the ends of the fingers opposite the stripper jaws. Similar camming surfaces **74** are located on the lower outer edges of the stripping fingers spaced longitudinally thereon from the camming surfaces **73**, the function and purpose of these camming surfaces being explained hereinafter.

The floating plate **67** is connected to the frame by means of a screw **77** which passes through an aperture in the plate and is threadedly received in plate **39** which is rigidly connected to the frame **21**. A small amount of clearance **78** is permitted to exist between the plate **67** and the head of the screw **77** so as to permit the plate **67** to have a limited amount of pivotal movement in the vertical direction, the stripper jaws thus being permitted to have a limited amount of pivotal movement in a vertical direction with the screw **77** acting as the pivot therefor. Mounted beneath the other end of the floating plate **67** is a compression spring **79** which spring is contained within a cavity **82** formed within a plate **83** connected to the side plate members **22** and **23**. One end of the spring **79** bears against the underside of the plate **67** while the other end of the spring bears against the plate **83**. The spring **79** thus tends to bias the plate **67** and its associated stripper fingers **61** and **62** in an upward direction about the pivot **77**. The plate **67** is also provided with an opening **81** to permit the hereinafter described camming plug **103** to pass therethrough.

Located near the bottom of the apparatus is a pot catcher **84** consisting of a catch plate **86** which is connected by means of a bolt **87** to a plate **88** which is a part of the frame **21**. The outward end of the catch plate **84** contains an arcuate opening **89** therein, which opening is adapted to receive the falling pot after it has been

separated from the remainder of the stack by the stripper mechanism. After the pot has been caught by the catch plate **86** it can be manually removed therefrom by the operator and is thus ready for use. If the apparatus is to be used for widely varying pot sizes, the catch plate **86** can be readily removed from the machine by removing the holding bolts **87** and replacing the catch plate with a new plate having an opening **89** therein of a size suitably adapted for the size of the pot to be dispensed.

The actuating mechanism for opening and closing the clamping jaws and the stripper fingers and for pivoting the swing arm comprises a slideable cam means **91** having first, second, and third cam members **92**, **93** and **94** (FIGURE 2) respectively. The first, second and third cam members are rigidly connected by means of screws **97** which pass through the lower ends of the first and second cam members **92** and **93**, which screws also pass through the upper end of the third cam member **94**. The upper ends of the cam members **92** and **93** are innerconnected by means of a joining plate **98**, which plate is connected to the first and second cam members by means of bolts **99**. The joining plate **98** has a centrally located vertical hole **101** therein which receives a cylindrical extension or stud **102** of a camming plug **103**, the camming plug **103** being rigidly innerconnected with the joining plate **98** by means of a screw **104** threadedly received in the stud **102**, the head of the screw **104** bearing on the upper surface of the joining plate **98**.

Mounted on the inner or confronting surfaces of the side plates **22** and **23** are vertical guideways **107** and **108** (FIGURE 8) having a generally U-shaped configuration so as to form a vertical slot **109** therein. The straight vertical edges of the cam members **92** and **93** are received within the slot **109** for guided reciprocable movement therein. Mounted beneath the slideable cam means **91** is a power cylinder **111** having a piston rod **112** extending therefrom, the end of the piston rod having a clevis **113** thereon whereby the piston rod is connected to the lower end of the third cam member **94** by means of a pin **114** passing through aligned openings in the clevis and cam member. Energization of the power cylinder **111** thus causes the movable cam means **91**, consisting of first cam member **92**, second cam member **93**, third cam member **94** and camming plug **103**, to be vertically reciprocated. The power cylinder **111** as shown is preferably a double-acting pneumatic cylinder. However, a hydraulic cylinder or any other conventional mechanical means could be utilized for reciprocating the movable cam means **91** if desired. Furthermore, switches (not shown) may be mounted on the frame of the machine so as to coact with either the piston rod or the movable cam means so as to control the extremities of the stroke movement.

Considering the camming plug **103** (FIGURES 1 through 3), the plug is composed of a plurality of stepped, preferably cylindrical, portions **116**, **117**, **118** and **119** respectively, the stepped portions **116** and **117** being joined by a tapered, preferably conical, camming portion **122** and the portions **118** and **119** being joined by a tapered, preferably conical, camming portion **123**. When the movable cam means **91** and the camming plug **103** are in their extended or uppermost positions as shown in FIGURE 3, the leftward (FIGURE 1) ends of the clamping levers **43** and **44** and the stripper fingers **61** and **62** are urged by the cams **57** and **74** inwardly so that their rightward, operating, ends are in their outward open position. When the camming plug **103** is moved downwardly, the tapered conical camming portion **123** coacts with the tapered camming surfaces **56** causing the clamping jaws to be pivoted inwardly to clamp the stack of pots contained in the apparatus. Simultaneously with the above action, the tapered conical camming portion **122** coacts wtih the tapered camming surfaces **73** causing the stripper jaws to be pivoted inwardly into engagement with the stack of pots so that the stripper jaws overlie the upper edge of the lowermost pot P_1 in the stack. The camming plug is thus effective to move the clamping jaws and the stripper jaws from the open to the closed positions as the plug is moved in a downward direction.

The first and second cam members **92** and **93** are effective to move the stripper and the clamping jaws from the closed to the open position when the movable cam means **91** is moved in upward direction.

The cam members **92** and **93** possess cam ribs **126** and **127**, respectively thereon, the cam ribs having upper straight guide portions **128** thereon which terminate at their lower ends in shoulders **129**, the straight guide portions **128** and shoulders **129** being joined by inclined cam surfaces **131**. Each of the cam ribs likewise has a lower straight guide portion **132** having a shoulder **133** at its upper end and a camming surface **134** at its lower end.

The movement of the cam means **91** also functions to control the pivotal movement of the swing arm device **37**. As shown in FIGURES 2 and 3, the first cam member **92** and the third cam member **94** are designed so as to form a swing lever slot **139**, which slot coacts with the edges of the lever **37** for controlling pivotal movement of the lever from a first position under the pots to a second position outwardly from said pots as shown in dotted lines in FIGURE 6. The cam members **92** and **94** are respectively formed with straight camming surfaces **141** and **142** respectively, which surfaces are joined by tapered camming surfaces **143** and **144** respectively. Downward movement of the cam means **91** from the position show in FIGURE 3 to the position shown in FIGURE 2 causes the lever **37** to be swung outwardly from underneath the pots allowing the single pot to be dispensed and dropped into the catch plate **86**.

FIGURE 5 also illustrates a modification of the basic stripper jaw structure which has been illustrated and explained above. In some situations, the above-described mechanism may be insufficient to efficiently separate the lowermost pot from the stack. Furthermore, if such separation does occur, the stripper jaws may cause some damage to occur to the upper edges of the dispensed pot if the pots are very tightly stacked together. To assist in loosening the lowermost pot on the stack, suitable reciprocably movable nozzle carriers, here the modified stripper jaws **63** and **64** shown in FIGURE 5, carry nozzles, or jet openings, **147** and **148** respectively, which openings may be suitably connected to a source of compressed air. The nozzles **147** and **148** are located adjacent the cylindrical surface **65** and are directed downwardly so as to direct a stream of compressed air onto the upper edge of the lowermost pot and into the inner face region between the lowermost pot P_1 and the next pot P_2 contained therein. In this manner, the air jet applies a force tending to drive the lowermost pot P_1 downwardly while at the same time tends to inject air between the bottom two pots, thus tending to loosen the pots and permitting the lowermost pot to be readily separated. The air jets can be used to supplement the action of the stripper jaws if desired.

OPERATION

When it is desired to operate the above-described apparatus, assuming that the power cylinder **111** and the movable cams means **91** are in their lowermost or retracted position, the operator will first energize the power cylinder **111** causing the movable cam means to be moved upward to its uppermost position. When the cam means **91** is moved upwardly, the camming surfaces **131** and **134** will coact with the camming surfaces **57** on the clamping levers and the camming surfaces **74** on the stripper fingers respectively, causing the clamping jaws and the stripper jaws to be moved outwardly into their open positions. Said upward movement of the movable cam means **91** will also cause the camming surface **143** to coact with the swing arm **37** so as to cause the

swing arm to move inwardly into a position whereby the block **41** will be positioned directly under the tubular pot guide **31**. When the movable cam **91** reaches its uppermost position, the upper surface **137** of the third cam member **94** will bear against the lower surface of the floating plate **67** tending to pivot the stripper mechanism upwardly whereby the stripper jaws will be at an elevation slightly above the upper edge of the lowermost pot P_1. The operator will then place a stack of pots into the apparatus by inserting the stack into the machine through the upper opening **32** of the guide tube **31**, the stack being allowed to drop through the tube until the lowermost pot P_1 bears against the block **41**. At this time, the machine will be in condition for the separation and individual dispensing of the pots contained therein.

To commence a dispensing operation of the apparatus, the operator will energize the power cylinder **111** in the downward direction causing the movable cam means **91** to be moved downwardly. Downward movement will cause the tapered conical camming surface **123** on the plug **103** to coact with the camming surfaces **56** on the clamping levers, thus causing the clamping levers to move from an open to the closed position as shown in FIGURE 4. The clamping jaws **51** and **52** will thus be brought into engagement with the external surfaces of several pots contained in the stack. Due to the over-all width of the clamping jaws, the jaws will make contact with several pots, thus distributing the load over a considerable area and thus not applying any harmful force to the pots. The clamping jaw is positioned such that it will clamp onto the second lowermost pot P_2 and will also clamp onto several pots located thereabove. The lowermost pot P_1 will not be contacted by the clamping jaws. While the above-clamping action is taking place, the downward movement will also cause the tapered conical camming surface **122** to be brought into contact with the tapered camming surfaces **73** on the stripper arms **61** and **62**, thus causing the stripper jaws **63** and **64** to be swung inwardly into the closed position shown in FIGURE 5. The stripper jaws will be swung inwardly into a relationship whereby they will be adjacent the periphery of the second lowermost pot P_2 with the lower surface of the jaws overlying the upper edge of the lowermost pot P_1. Continued downward movement of the cam means **91** will cause the camming surface **144** to contact the edge of the swing arm **37** causing the swing arm to pivot outwardly from beneath the tubular pot guide **31**, the stack of pots being now held solely by the clamp jaws **51** and **52**. Further downward movement of the cam means **91** will cause the shoulders **133** to come into contact with the upper edge of the stripper fingers **61** and **62**, thus causing the entire stripper mechanism to be pivoted downwardly about the pivot **77**. The downward pivotal movement of the stripper mechanism will cause the lower surfaces of the stripper jaws **63** and **64** to come into contact with the upper edge of the lowermost pot P_1, thus applying a force on the pot in a downward direction and causing the pot to separate from the stack. Upon separation, the pot P_1 will freely fall into the opening **89** of the catch plate **86** whereby it can be manually removed by the operator and is thus ready for utilization. The movable cam means will have then reached its lowermost or retracted position and the cycle will be complete.

To begin a new cycle, the power cylinder **111** will again be energized in the upward direction causing the movable cam means to move upwardly whereby the stripper jaws and the clamping jaws will be cammed outwardly into an open position by the cams **134** and **131** respectively. However, before the above jaws are cammed into the open position, the swing arm **131** will be cammed inwardly by the cam surface **143** so that the block member **41** is positioned beneath the bottom surface of the lowermost pot. Thus, when the clamping jaws are released and swung into their open position, the pots will drop onto the block member **41**. Continued upward movement of the movable cam means **91** will cause the surface **137** to bear against the plate **67** of the stripper mechanism causing it to pivot upwardly by an amount sufficient to cause the stripper jaws to be at an elevation above the edge of the lowermost pot and thus being in a position to grip the pot and cause separation thereof from the stack when the movable cam means is again moved downwardly.

If desired, limited switches can be utilized to control the stroke extremities of the movable cam means so as to cause automatic recycling of the power cylinder whereby the apparatus will automatically and continuously separate and dispense the pots after the machine has been initially put into operation.

It will be recognized that by this mechanism a single operator can separate a large number of pots in a relatively short time with the minimum amount of damage to the pot structure. Furthermore, the separation operation requires a minimum amount of operator supervision since the machine, after being put into operation, will continue to automatically and continuously dispense the pots without the aid of any operator control.

Further, the machine described is of low cost to build and to maintain. The machine contains only simple linkages which require little expensive machining and are of very simple operation and therefore dependability of operation is ensured. Furthermore, only a minimum number of power mechanisms is used, therefore requiring very little maintenance.

By making said camming plug of circular cross section, as above indicated to be preferred, same can be rotated to compensate for wear of its cam surfaces without change in the operation of the equipment. Wear on the cam surfaces **56** or **57** of the gripping levers **43** and **44** can be compensated by grinding down the surfaces **51***a* and **52***a* of the jaws **51** and **52** (or by grinding the opposed and contacting surfaces of the levers **43** and **44**).

The machine described is furthermore well adapted for varying sizes of pots since the stripper jaws and the clamping jaws can be easily and readily interchanged so as to be adaptable to various pot sizes. This change can be made with a minimum amount of effort since only the jaws have to be replaced, the remainder of the machine being basically the same and operating in exactly the same manner. Furthermore, if desired, the machine could be made completely automatic by locating a conveyor underneath the tubular pot guide so that the pots, when separated and dispensed, will be deposited into the conveyor and automatically conveyed to a new work location, thus requiring no manual supervision or effort on the part of a machine operator and thus permitting the machine to operate completely automatically.

Although a particular preferred embodiment has been described for illustrative purposes, it will be recognized that variations or modifications of such disclosure which lie within the scope of the appended claims are fully contemplated.

The embodiments of the invention in which an exclusive property or privilege is claimed are defined as follows:

1. A pot dispensing apparatus for separating and dispensing individual pots, in particular delicate nursery pots, from a stack thereof, said apparatus comprising:

a frame, said frame being adaptable to receive a stack of pots therein;

dispensing means mounted on said frame and including clamping means for holding the stack of pots and separating means for removing the lowermost pot from the stack;

said clamping means having a pair of jaws which are engageable on substantially opposite sides of the periphery of pots contained in said stack, at least one of said jaws being movable from an open position out of engagement with said pots to a closed position in clamping engagement with at least one of said pots;

said separating means including a pair of fingers engageable with the upper edge of the lowermost pot, the separating means being mounted on said frame so as to permit pivotal movement of said fingers in a first plane substantially perpendicular to a longitudinal axis formed by said stack while also permitting pivotal movement of said fingers in a second plane substantially transverse to said first plane; and

actuating means for controlling the dispensing means so as to permit individual pots to be separated and dispensed from the apparatus.

2. A pot dispensing apparatus for separating and dispensing individual pots, in particular delicate nursery pots, from a stack thereof, said apparatus comprising:

a frame, said frame being adaptable to receive a stack of pots therein;

dispensing means mounted on said frame and including clamping means for holding the stack of pots and separating means for removing the lowermost pot from the stack;

actuating means for controlling the dispensing means so as to permit individual pots to be separated and dispensed from the apparatus;

said clamping means including a pair of levers pivotably mounted on said frame, each of said levers having a jaw mounted at one end thereof for engagement with the outer peripheral surface of said pots, said levers being controlled by said actuating means for opposed synchronous movement from an open position to a closed position, said jaws in said open position being substantially spaced from said pots while in said closed position being in engagement therewith on substantially opposite peripheral sides thereof;

said separating means including a pair of levers each having a finger at one end thereof engageable with the upper edge of the lowermost pot for separating same from the stack, said levers being pivotably mounted relative to the frame and controlled by said actuating means for opposed synchronous movement between a first position wherein the fingers are spaced from the periphery of said pots and a second position wherein the fingers are positioned adjacent the periphery of said pots;

stop means for maintaining said stack of pots in position when the clamping means is released, said stop means being movable from a first position wherein the stop means is located beneath the bottom surface of the lowermost pot to a second position spaced from said pots so as to permit the lowermost pot to be dispensed from the apparatus; and

said actuating means including a reciprocable cam means, movement of said sam means in one direction causing said clamping jaws to be cammed to said closed position and said fingers and said stop means to be moved to their respective second positions, movement of the reciprocable cam means in the other direction causing the fingers and the stop means to be moved to the respective first positions and the clamping jaws to be moved to their open position.

3. The apparatus of claim 2 wherein said separating means is mounted to said frame for pivotal movement in a second plane substantially transverse to a plane defined by the pivotal movement of said fingers from said first to said second positions, said separating means and said fingers being moved in said second plane so as to engage an upper edge of the lowermost pot and separate the same from the stack when the actuating means moves in said one direction.

4. The apparatus of claim 2 wherein the reciprocable cam means has a first cam member for controlling the movement of the clamping means, the separating means and the stop means when the reciprocable cam means is moved in said one direction; and a second cam member for controlling the movement of said clamping means, separating means and stop means as said reciprocable cam means is moved in said other direction.

5. A pot dispensing apparatus for separating and dispensing individual pots, in particular delicate nursery pots, from a stack thereof, said apparatus comprising:

a frame, said frame being adaptable to receive a stack of pots therein;

dispensing means mounted on said frame and including clamping means for holding the stack of pots and separating means for removing the lowermost pot from the stack;

said clamping means having a pair of jaws which are engageable on substantially opposite sides of the periphery of pots contained in said stack, at least one of said jaws being movable from an open position out of engagement with said pots to a closed position in clamping engagement with at least one of said pots;

said separating means having a pair of levers mounted on said frame for pivotal movement in a plane substantially perpendicular to a longitudinal axis formed by said stack of pots, each of said levers having a stripper finger mounted adjacent one end thereof with said stripper fingers being positionable above and engageable with the upper edge of the lowermost pot for permitting same to be separated from said stack; and

actuating means for controlling the dispensing means so as to permit individual pots to be separated and dispensed from the apparatus, said actuating means including a reciprocable cam means for controlling the operation of said separating means, said reciprocating cam means coacting with said stripper levers for positively camming said stripper fingers from a first inner position wherein said stripper fingers are spaced substantially adjacent the periphery of said pots and overlie the upper edge of the lowermost pot in the stack to a second outer position wherein the stripper fingers are spaced radially outwardly from the periphery of the upper edge of said pots.

6. A pot dispensing apparatus for separating and dispensing individual pots, in particular delicate nursery pots, from a stack thereof, said apparatus comprising:

a frame, said frame being adaptable to receive a stack of pots therein;

dispensing means mounted on said frame and including clamping means for holding the stack of pots and separating means for removing the lowermost pot from the stack;

said clamping means having a pair of jaws which are engageable on substantially opposite sides of the periphery of pots contained in said stack, at least one of said jaws being movable from an open position out of engagement with said pots to a closed position in clamping engagement with at least one of said pots;

said separating means having a pair of fingers engageable with the upper edge of the lowermost pot for separating same from said stack, said separating means being mounted on said frame so as to permit pivotable movement of said fingers in a first plane substantially perpendicular to the longitudinal axis formed by said stack while also permitting movement of said fingers in a second plane substantially transverse to said first plane; and

actuating means for controlling the dispensing means so as to permit individual pots to be separated and dispensed from the apparatus, said actuating means including a reciprocable cam member for controlling the clamping means and the separating means;

said reciprocable cam member having a shoulder means formed thereon adapted to engage said pair of fingers when said fingers are positioned substantially adjacent the periphery of said pots and overlying the

upper edge of the lowermost pot, downward movement of said reciprocable cam member causing said shoulder means to contact said pair of fingers, which pair of fingers are then moved substantially vertically downwardly into engagement with the upper edge of the lowermost pot whereupon the lowermost pot is separated from the stack.

7. A pot dispensing apparatus for separating and dispensing individual pots, in particular delicate nursery pots, from a stack thereof, said apparatus comprising:

a frame, said frame being adaptable to receive a stack of pots therein;

dispensing means mounted on said frame and including clamping means for holding the stack of pots and separating means for removing the lowermost pot from the stack;

actuating means for controlling the dispensing means so as to permit individual pots to be separated and dispensed from the apparatus;

said clamping means including a pair of clamping levers pivotably mounted on said frame, each of said clamping levers having a clamping jaw mounted at one end thereof with said pair of jaws being engageable on substantially opposite sides of the periphery of pots contained in said stack, said levers being controlled by said actuating means for opposed synchronous movement from an open position out of engagement with said pots to a closed position wherein said jaws are in clamping engagement with at least one of said pots;

said separating means having fingers engageable with the upper edge of the lowermost pot for esparating same from said stack; and

said separating means further including a pair of opposed nozzle carriers mounted for approach-and-retract movement relative to said frame and a pressure fluid nozzle on each of said carriers movable by said carriers from a first position wherein the nozzle carriers are spaced from the periphery of said pots to a second position wherein the nozzle carriers are spaced substantially adjacent the periphery of said pots and overlie the upper edge of the lowermost pot in the stack for assisting in removing the lowermost pot from the stack.

8. A pot dispensing apparatus for separating and dispensing individual pots, in particular delicate nursery pots, from a stack thereof, said apparatus comprising:

a frame, said frame being adaptable to receive a stack of pots therein;

dispensing means mounted on said frame and including clamping means for holding the stack of pots and separating means for removing the lowermost pot from the stack;

actuating means for controlling the dispensing means so as to permit individual pots to be separated and dispensed from the apparatus;

said clamping means including a pair of clamping levers pivotably mounted on said frame, each of said levers having a clamping jaw mounted at one end thereof, said levers being controlled by said actuating means for opposed synchronous movement from an open position out of engagement with said pots to a closed position wherein said jaws are in clamping engagement with at least one of said pots on substantially opposite sides of the periphery thereof;

said separating means including a pair of stripper levers each having a stripper finger adjacent one end thereof, said pair of stripper levers being mounted on said frame so as to permit pivotable movement of said fingers in a first plane substantially perpendicular to a longitudinal axis formed by said stack while also permitting movement of said fingers in a second plane substantially transverse to said first plane, said stripper fingers being controlled by said actuating means for opposed synchronous movement whereby said fingers are moved from a first position wherein the fingers are spaced from the periphery of said pots to a second position wherein the fingers are spaced substantially adjacent the periphery of said pots and overlie the upper edge of the lowermost pot in the stack for permitting same to be separated from said stack; and

said actuating means including a reciprocable cam means for controlling said clamping means and said separating means.

9. The apparatus of claim 8 wherein said reciprocable cam means includes a reciprocable cam member coacting with said clamping means and said separating means for positively camming said clamping jaws from said closed to said open position and for positively camming the stripper fingers from said second to said first position.

10. The apparatus of claim 8 wherein said reciprocable cam means coact with said clamping means and said separating means for positively camming said clamping jaws from said open to said closed position and for positively camming the stripper fingers from said first to said second position.

11. The apparatus of claim 8 further including stop means movable between first and second positions, said stop means in said first position holding said stack of pots in said apparatus when the clamp means is in said open position, said stop means in said second position permitting the separated pot to be dispensed from the apparatus; said reciprocable cam means coacting with said stop means whereby said stop means is positively cammed from said first position to said second position when said reciprocable cam means is moved in a first direction, said stop means being positively cammed from said second position to said first position when said reciprocable cam means is moved in the opposite direction.

12. The apparatus of claim 8 wherein said reciprocable cam means includes a reciprocable cam member for controlling said clamping means and said separating means, said cam member having first and second similar portions positioned on opposite sides of both said pair of clamping levers and said pair of stripper levers, said cam member further having a third portion positioned between both said pair of clamping levers and said pair of stripper levers, said portions coacting with said clamping levers and said stripper levers for moving same when said reciprocable cam member is moved.

13. The apparatus of claim 8 wherein said actuating means further includes a fluid pressure cylinder interconnected to said reciprocable cam means for linearly reciprocating same.

14. The apparatus of claim 8 wherein said clamping jaws are detachably mounted on said clamping levers and wherein said stripper fingers are detachably mounted to said stripper levers, said clamping jaws and said stripper fingers thus be readily interchangeable.

15. The apparatus of claim 8 wherein said apparatus contains a stack of delicate and disintegrable nursery pots therein having no top rims thereon, said clamping jaws having arcuate clamping surfaces thereon of a configuration substantially similar to the periphery of said pots, said clamping surfaces being elongated in the direction of the longitudinal axis of said stack of pots whereby said clamping jaws uniformly clamp a plurality of pots.

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