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Bahnsen

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[54] **TOWEL DISPENSING CABINET WITH SCRAPER ATTACHMENT**

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[21] Appl. No.: **110,102**

[52] **U.S. Cl.** **312/38**

[51] **Int. Cl.** **B65h 19/00**

[58] **Field of Search** 312/37.38

[56] **References Cited**

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2,120,023	6/1938	Bersaques	312/38
2,899,251	8/1959	Birr	312/38

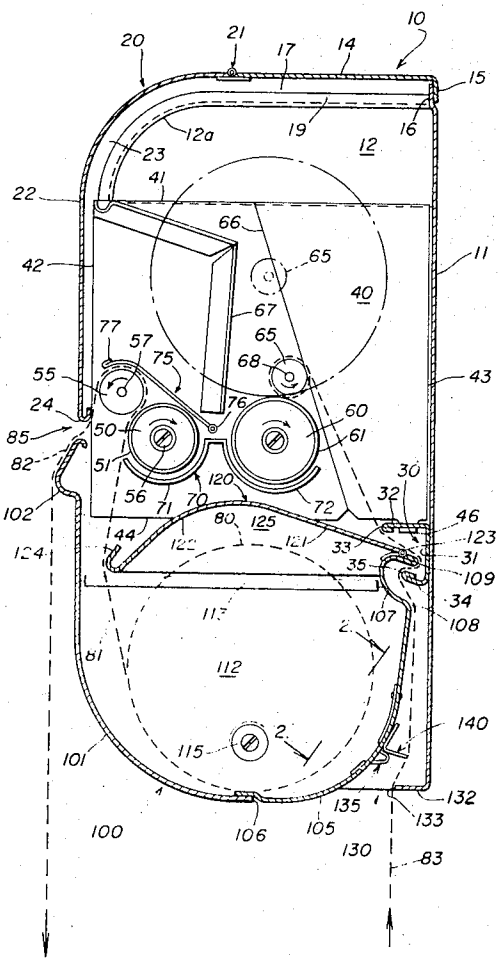
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[57] **ABSTRACT**

A continuous towel dispensing cabinet includes an open-bottom housing having associated therewith a loop of towel that extends along an exit path to an exposed position accessible to a user and thence along a return path into the housing, an open-top clean towel receptacle mounted in the bottom of the housing and provided with a cover hingedly mounted thereon, dispensing apparatus and soiled towel take-up means mounted in the housing overlying the receptacle for respectively feeding clean towel to the exit path and retracting soiled towel from the return path, guard members for separating the dispensing apparatus and the take-up means from each other and from the receptacle, first and second scraper members carried by the receptacle adjacent to the open bottom thereof and cooperating to engage and scrape the soiled towel to remove soil particles therefrom, the first scraper member being detachably mounted on the receptacle by means of resilient retaining structure to facilitate cleaning and servicing thereof.

16 Claims, 6 Drawing Figures

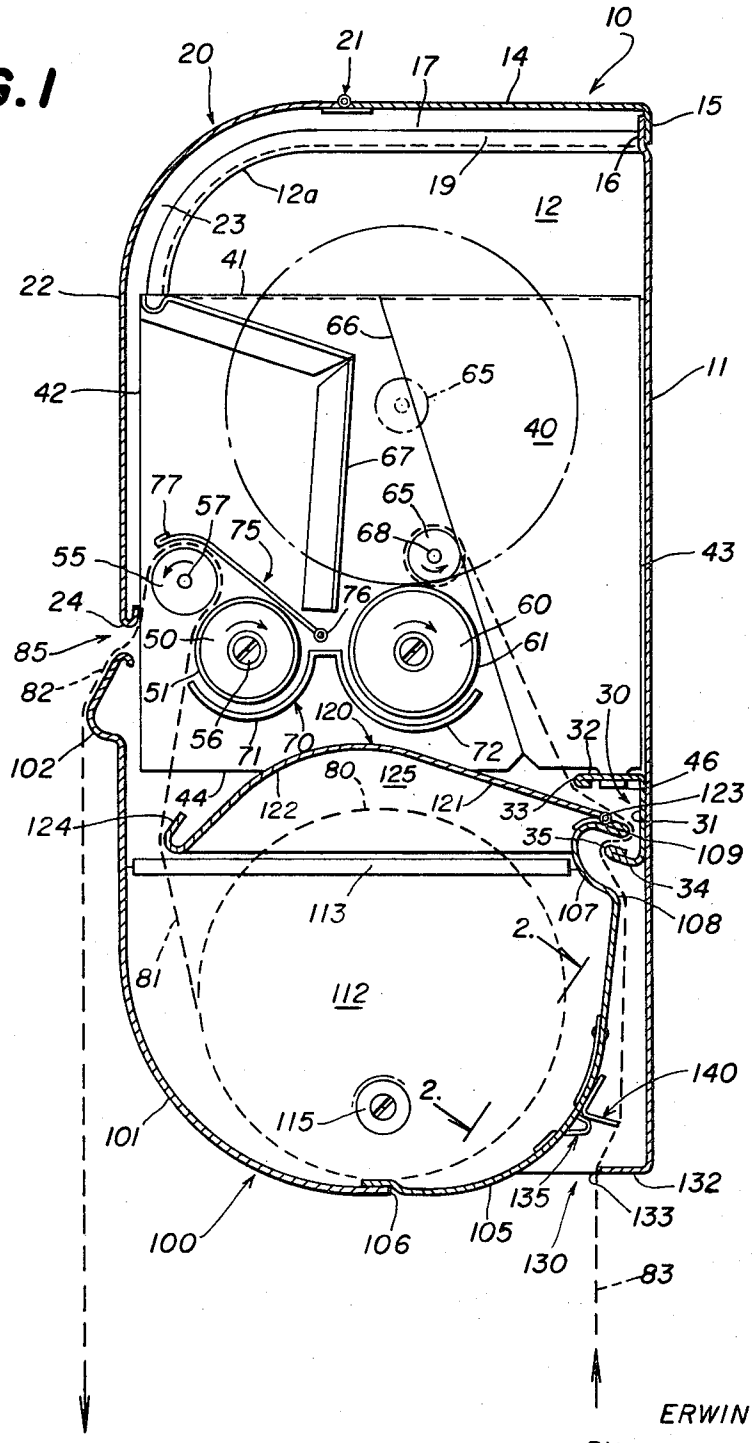


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FIG. 1



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FIG. 2

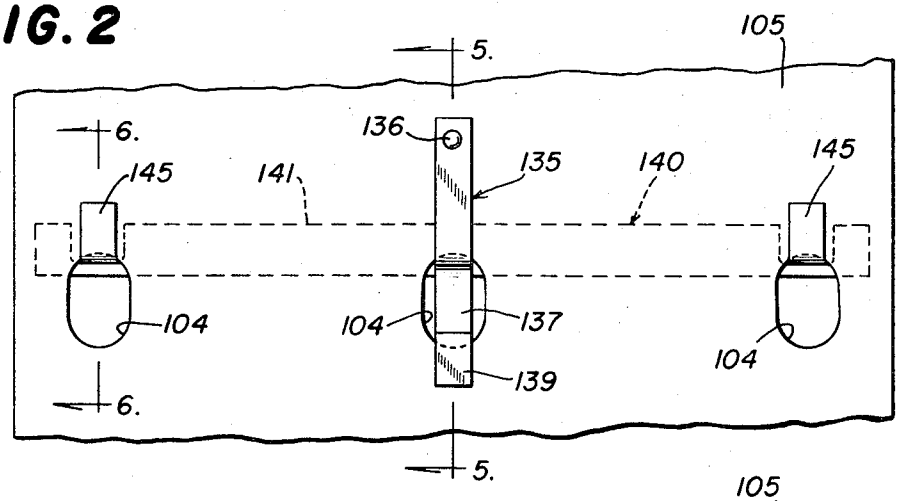


FIG. 3

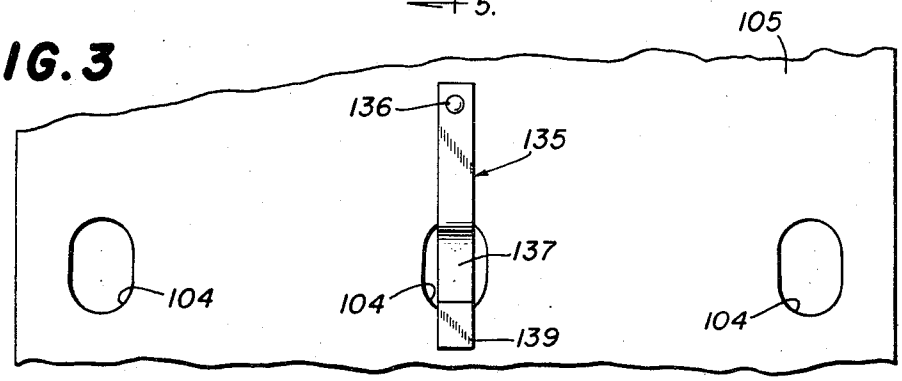


FIG. 4

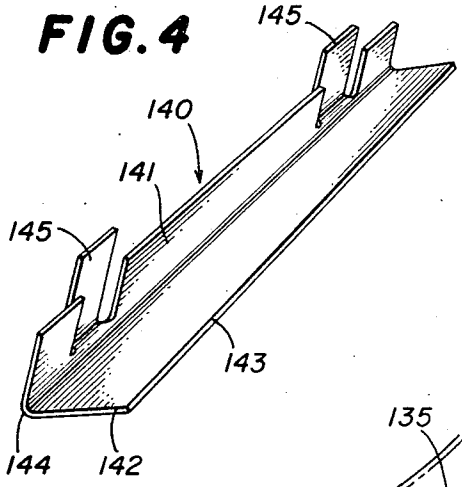
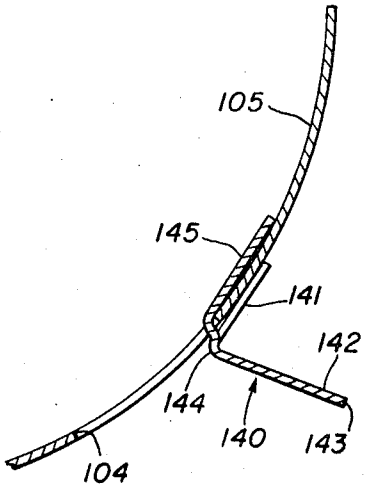


FIG. 5

FIG. 6



TOWEL DISPENSING CABINET WITH SCRAPER ATTACHMENT

The present invention relates generally to improvements in dispensing cabinets and, more particularly, to improvements in the operation of cloth towel dispensing cabinets of the continuous type.

It is a general object of this invention to provide means for removing soil particles from the soiled towel before take-up into the dispensing cabinet for thereby preventing contamination of the clean towel supply.

It is an important object of this invention to provide a towel dispenser of the continuous type comprising a housing having a dispensing opening therein and having associated therewith a loop of towel that extends along an exit path through the dispensing opening to an exposed position accessible to a user and thence along a return path into the housing, a receptacle mounted in the housing and having an access opening therein for accommodating therein a supply of clean towel, towel dispensing apparatus mounted in the housing for dispensing clean towel from the receptacle through the dispensing opening into the loop along the exit path when the accessible portion of the loop is pulled by a user, loop take-up means mounted in the housing and coupled to the dispensing apparatus for retracting and storing soiled towel from the return path, the take-up means and an upper portion of the return path overlying a portion of the receptacle, and scraper mechanism carried by the housing below the access opening and the dispensing apparatus for engaging and scraping the soiled towel to remove soil particles therefrom before reaching the upper portion of the return path, whereby soil particles which may be carried by the soiled towel along the return path are prevented from falling into the receptacle and the dispensing apparatus and contaminating the clean towel therein.

It is another object of this invention to provide a towel dispenser of the type set forth, wherein said scraper mechanism includes two spaced apart scraping members carried by the housing below the access opening and the dispensing apparatus and extending generally toward each other.

It is another object of this invention to provide a towel dispenser of the type set forth, wherein the rear of the receptacle is spaced forwardly from the adjacent portion of the housing for defining therebetween a lower portion of the rear path, one of the scraping members being detachably mounted on the rear of the receptacle and extending rearwardly therefrom and the other of the scraping members being carried by the rear of the housing and extending forwardly therefrom adjacent to one scraping member.

Still another object of the invention is to provide a towel dispenser of the type set forth, wherein the receptacle is provided with a mounting opening therein adjacent to the lower rear end thereof, the one scraping member having a scraping blade and a mounting tab thereon and having a scraping position with the mounting tab received in the mounting opening and the scraping blade extending rearwardly from the receptacle, and further including retaining means engaging the one scraping member in the scraping position thereof for releasably holding the one scraping member in its scraping position.

Yet another object of this invention is to provide a towel dispenser of the type set forth, which further includes a shield member and a guard member and a receptacle cover, all cooperating to separate the dispensing apparatus and the take-up means from each other and from the open-top receptacle for further insuring that any soil particles which may not be removed by the scraping mechanism will be prevented from contaminating the clean towel supply.

Further features of the invention pertain to the particular arrangement of the parts of the towel dispenser, whereby the above-outlined and additional operating features thereof are attained.

The invention, both as to its organization and method of operation, together with further objects and advantages thereof will best be understood with reference to the following specification taken in connection with the accompanying drawings, in which:

FIG. **1** is a side elevational view of the dispensing cabinet of the present invention, with the right side wall (as viewed from the front) removed to more clearly illustrate the interior of the cabinet;

FIG. **2** is an enlarged fragmentary view of a portion of the receptacle taken along the line **2—2** in FIG. **1**, and illustrating the detachable scraper member mounted in its scraping position;

FIG. **3** is a view similar to FIG. **2**, but showing the receptacle with the detachable scraper member removed;

FIG. **4** is a perspective view of the detachable scraper member of the present invention;

FIG. **5** is a view in vertical section taken along the line **5—5** in FIG. **2**, and illustrating the operation of the retaining member for holding the detachable scraper member mounted in its scraping position; and

FIG. **6** is a view in vertical section taken along the line **6—6** in FIG. **2**, and illustrating the cooperation between the receptacle and the attachment flange and mounting tabs of the detachable scraper member.

Referring now to FIG. **1** of the drawings, there is shown a towel dispensing cabinet according to the present invention, which is an improvement of the towel dispensing cabinet disclosed in my copending U.S. application Ser. No. 8,125, titled "TOWEL DISPENSING CABINET WITH COVERED CLEAN TOWEL RECEPTACLE," filed on Jan. 15, 1970, now U.S. Pat. No. 3,637,275 and assigned to the assignee of the present invention. Certain portions of the internal mechanism of the dispensing cabinet have been deleted from the drawing herein for purposes of clarity, all of the deleted portions being disclosed in detail in the aforementioned U.S. application and in U.S. Pat. No. 2,899,251, issued to R. G. Birr, Aug. 11, 1959, the disclosures of which application and patent are incorporated herein by reference.

The towel dispensing cabinet of this invention includes a housing, generally designated by the numeral **10**, having a rear wall **11** and a pair of opposed side walls **12**, all of sheet metal and fabricated in one piece, one of the side walls being shown in FIG. **1**. The top front corners of the side walls **12** are rounded as at **12***a*. A top wall **14** closes the upper end of the housing **10** and includes a downwardly extending rear flange **15** secured to an inwardly offset flange **16** at the upper edge of the rear wall **11** in overlapping relationship therewith. A pair of side flanges **17** respectively depend from the side edges of the top wall **14** and are respec-

tively secured to inwardly offset flanges **19** at the upper edges of the side walls **12** in overlapping relationship therewith. The forward portion of the top and the upper portion of the front of the housing **10** is formed as a single upper door **20** pivotally mounted on the front edge of the top wall **14** by hinges **21**. The upper door **20** is shaped complementary to the adjacent rounded portion of the side walls **12** and includes a front panel **22** and a pair of side flanges **23** extending inwardly from the side edges of the front panel **22** and cooperating respectively with the offset flanges **19** formed in the side walls **12**. The lower end of the front panel **22** is bent inwardly and upwardly to form an arcuate flange **24** along the bottom edge of the upper door **20**.

Mounted on the inner surface of the rear wall **11** intermediate the upper and lower ends thereof is a horizontally disposed channel-shaped member, generally designated by the numeral **30**, and including a bight portion **31** disposed parallel to the rear wall **11** and fastened thereto by appropriate means. Integral with the upper edge of the bight **31** and extending forwardly therefrom, and substantially normal thereto is a relatively long upper leg **32**, the forward end of which is folded back to form a rounded edge **33**. Integral with the lower edge of the bight **31** and extending forwardly and upwardly therefrom is a relatively short lower leg **34** having the forward end thereof folded back to form a rounded edge **35**. The purpose of the channel member **30** will be described more fully hereinafter.

Respectively mounted on the inner surfaces of the side walls **12**, intermediate the upper and lower ends thereof, are two upright side plates, generally designated by the numeral **40**, disposed substantially parallel to the side walls **12** and each provided with a top outwardly turned flange **41** and a front outwardly turned flange **42** and a rear flange **43** and a bottom outwardly turned flange **44**. The top and bottom outwardly turned flanges **41** and **44** are secured at the respective front ends thereof to the upper and lower edges of the front flange **42** in order to further stiffen the side plate **40**. The side plates **40** are each secured to the housing **10** by suitable means (not shown) described in detail in the aforementioned U.S. Pat. No. 2,899,251. Depending from the lower edge of each of the side plates **40** is an attachment tab **46** received in a corresponding slot in the upper leg **32** of the channel-shaped member **30** to further assist in supporting the side plates **40**.

Mounted between the side plates **40** toward the front of the housing **10** is a measuring roll **50**, the outer surfaces of the measuring roll **50** being covered with a suitable friction material **51** such as sandpaper, emery cloth or the like to provide improved frictional engagement of the surface of the measuring roll **50** with the towel to be dispensed, as will be described more fully hereinafter. The measuring roll is supported at the opposite ends thereof by trunnions **56**. Mounted between the side plates **40** adjacent to the measuring roll **50** and slightly forwardly thereof is a pinch roll **55**, supported at the opposite ends thereof by trunnions **57** disposed in complementary bearing members (not shown) which are adapted to respectively slide vertically in oppositely disposed corresponding guide members on the inner surfaces of the side plates **40**. In use, the pinch roll **55** is held in engagement with the surface of the measuring roll **50** by gravity.

A take-up drive roll **60** is mounted between the side plates **40** rearwardly of the measuring roll **50** and is provided on the outer surface thereof with suitable frictional material **61** such as sandpaper, emery cloth or the like for providing improved frictional engagement with the towel, as will be described more fully hereinafter. Mounted between the side plates **40** above the drive roll **60** is a soiled towel take-up roll **65**, held in engagement with the drive roll **60** by gravity. Also disposed along the inner surfaces of each of the side plates **40** are a rear guide member **66** and a front guide member **67**, converging toward the top of the housing **10**. In use, trunnions **68** respectively extending from the opposite ends of the take-up roll **65** are disposed between the guide members **66** and **67** for limiting the forward and rearward movements of the take-up roll **65**, while permitting vertical movement of the take-up roll **65** as the diameter thereof increases with the accumulation of soiled towel thereon. More particularly, with the rear and front guide members **66** and **67** spaced apart as shown in FIG. **1**, the take-up roll **65** is free to roll over the upper surface of the take-up drive roll **60** from a normal position with the trunnions **68** in engagement with the rear guide member **66** to a second forward position with the trunnions **68** in engagement with the front guide member **67**. As the diameter of the take-up roll **65** increases due to the winding of used towel thereon, the distance that the take-up roll may travel from its normal first position to its second position is gradually reduced.

The foregoing arrangement, which permits the take-up roll **65** to rotate over the surface of the take-up drive roll **66** between first and second positions, is provided to take up any excess towel that is drawn into the cabinet at the end of a particularly violent stopping action of the take-up drive roll **60**. In other words, the take-up roll **65** revolves in a counterclockwise direction, as indicated by the arrow in FIG. **1**, to take up the used towel as the take-up drive roll **60** rotates in a clockwise direction during a dispensing operation. When the take-up drive roll **60** is suddenly stopped at the end of a dispensing operation, the momentum of the take-up roll **65** is absorbed by permitting the take-up roll **65** to rotate and roll forwardly over the rough surface of the take-up drive roll **60** from the normal first position to the second position described above. Thus, the excess towel that is drawn into the cabinet as a result of the suddenly stopped take-up drive roll **60** will be wound onto the take-up roll **65**.

During the next dispensing operation, the take-up drive roll **60** will again rotate in the clockwise direction and during the initial phase of the operation it will carry the take-up roll **65** from the second position in engagement with the front guide **67** to the normal first position in engagement with the rear guide **66** without winding any towel on the take-up roll **65**. However, the normal amount of towel will be dispensed from the cabinet during the return movement of the take-up roll **65** from its second to its first position. Thus, the excess amount of towel that has been wound onto the take-up roll **65** resulting in a temporary shortening of the towel loop below the cabinet is replaced by the dispensing operation of the clean towel during the period in which the take-up roll **65** moves from its second position back to its first position without winding any of the used towel thereon. As soon as the take-up roll **65** again reaches

the normal take-up position in engagement with the rear guide **66**, the process of taking up the used towel and winding it onto the take-up roll **65** will be resumed. It is apparent that, as the diameter of the used towel wound onto the take-up roll **65** increases, the distance that the take-up roll **65** must travel from its normal first position to its second position in order to wind up the same amount of towel is correspondingly decreased. It is for this reason that the rear guides **66** and the front guides **67** converge toward the top of the housing **10**.

The measuring roll **50** is preferably smaller in diameter than the take-up drive roll **60**. This permits rotation of the measuring roll **50** through more than one revolution during each revolution of the take-up drive roll **60**, while at the same time dispensing substantially the same amount of clean towel from the cabinet as is taken up under control of the take-up drive roll during each dispensing operation, for the purposes best described in the aforementioned U.S. Pat. No. 2,899,251. Supported between the side plates **40** is a roller shield, generally designated by the numeral **70**, having two spaced-apart front and rear arcuate sections **71** and **72**, respectively conforming substantially to the contours of the measuring roll **50** and the take-up drive roll **60**, and spaced a slight distance therebelow. The front edge of the roll shield **70** is cut away at the center portion thereof to provide two spaced apart towel guides and an upturned lip (not shown) to guide the clean towel as it is fed upwardly between the measuring roll **50** and the pinch roll **55**, as will be described below. The roll shield **70**, in addition to serving as a brace between the side plates **40**, also functions to divide the interior of the housing **10** into an upper soiled towel compartment and a lower clean towel compartment. Preferably, the entire dispensing unit or mechanism for the cabinet is demountably supported in the housing **10**, as explained in detail in the aforementioned U.S. Pat. No. 2,899,251.

In addition, a guard plate, generally designated by the numeral **75**, is pivotally mounted at one end thereof between the side plates **40**, by means of pivot pins **76**. The guard plate **75** overlies the measuring roll **50** and the pinch roll **55**, and is provided with a curved front end **77** which is shaped to conform to the circumference of the pinch roll **55**. In use, the guard plate **75** rests against the top of the pinch roll **55**, or against the portion of the towel web extending therearound, as will be described below. The pivoted lower end of the guard plate **75** is disposed closely adjacent to the center of the roller shield **70** and cooperates therewith to effectively separate the dispensing mechanism, comprising the measuring roll **50** and the pinch roll **55**, from the take-up apparatus, which includes the soiled towel take-up drive roll **60** and soiled towel take-up roll **65**.

In the lower end of the housing **10** is mounted a clean towel receptacle, generally designated by the numeral **100**, and accommodating therein a roll **80** of clean towel. The receptacle **100** includes an upstanding front panel **101** forming a front wall of the receptacle and an upstanding rear panel **105** forming a rear wall of the receptacle **100**. The lower ends of the front and rear panels **101** and **105** are curved inwardly toward each other and are connected together as at **106** to form a bottom wall for the receptacle **100** which extends below and between the bottom edges of the respective side walls **12**. At the upper edge of the front panel **101** is a curved flange **102** spaced a slight distance below the flange **24** on the upper door **20** and cooperating therewith to define a slot or opening **85** into the housing **10** for dispensing clean towel therefrom. The upper edge of the rear panel **105** is indented as at **107** to form a rounded edge or knee **108** and a rearwardly extending flange **109** having a rounded outer edge. The rear panel **105** is also provided with three horizontally aligned oval mounting openings **104** adjacent to the bottom end thereof, for a purpose to be described more fully hereinafter. The opposite side ends of the front and rear panels **101** and **105** are closed by a pair of side or end walls **112** which are spaced apart from each other a distance slightly greater than the normal width of a supply roll of clean towel supported in the receptacle **100**.

These end walls **112** respectively conform in outline to the contours of the front and rear panels **101** and **105** and may be secured to the inner surfaces thereof in any suitable manner. The end walls **112** are respectively pivoted on supporting brackets **115** by means of pivot screws which pass outwardly through the side walls **112** and a portion of the brackets **115** and may be secured thereto by nuts, the supporting brackets **115** being respectively mounted on the inner surfaces of the side walls **12**. Respectively formed at the upper edges of the end walls **112** are downwardly and outwardly directed flanges **113**. The flanges **113** are preferably rectangular in shape and extend substantially the entire length of the end walls **112**, integral therewith. Also, a pair of transversely curved finishing strips (not shown) may be provided on the lower edges of the respective side walls **12** and turned inwardly to substantially close the spaces between the housing side walls **12** and the receptacle end walls **112**.

The receptacle **100** is open at the upper end thereof but is provided with a cover or guard plate, generally designated by the numeral **120**, which spans the distance between the end walls **112** and includes a flat rear portion **121** and a curved front portion **122**. The rear edge of the rear portion **121** is pivotally secured to the upper surface of the flange **109** on the rear panel **105** by pivot lugs **123**, or other suitable pivot mounting. Preferably, the rear portion **121** of the guard plate **120** is inclined upwardly from the flange **109**, and the curved front portion **122** slopes downwardly from the forward end of the rear portion **121**. The front edge of the guard plate **120** is bent back along the upper surface thereof to form a curved flange **124** defining a trough at the front end of the cover plate **120**. Respectively depending from the side edges of the guard plate **120** are a pair of side plates **125** which extend downwardly substantially to the bottom of the flange **124**. At the lower edges of the side plates **125** are respectively formed outwardly and downwardly directed flanges (not shown) disposed in use substantially parallel to the flanges **113** in overlapping relationship therewith, as is described more fully in my aforementioned U.S. application Ser. No. 8,125, now U.S. Pat. No. 3,637,275.

The receptacle **100** is pivotally movable on the mounting brackets **115** between an upstanding dispensing position, as illustrated in FIG. **1**, and a forwardly tilted loading position (not shown) extending

outwardly beyond the front edges of the side walls **112**. Thus, the front panel **101** of the receptacle **100** serves as a lower door for the housing **10** which is closed when the receptacle **100** is in the dispensing position thereof and is open when the receptacle **100** is in the loading position thereof. Also, the cover or guard plate **120** is pivotally movable on the hinge **123** between a closed configuration, as shown in FIG. **1**, and an open configuration (not shown). When the receptacle **100** is in the dispensing position thereof and the guard plate **120** is in the closed configuration thereof, as illustrated in FIG. **1**, flange **109** at the upper edge of the rear panel **105** is interposed between the upper and lower legs **32** and **34** of the channel-shaped member **30** and is substantially parallel to the lower leg **34**.

Integral with the bottom edge of the rear wall **11** of the housing **10**, and extending forwardly therefrom substantially normal thereto is a scraper flange or blade **132** which is generally rectangular in shape, and extends along the entire width of the rear wall **11**. The forward edge **133** of the scraper flange **132** defines a sharp scraping edge which engages the towel web along the return path thereof, in a manner to be more fully explained hereinafter. Secured to the rear panel **105** of the receptacle **100** is a retaining or latch member, generally designated by the numeral **135**. The retaining member **135** preferably comprises a narrow strip of spring steel, secured at the upper end thereof to the inner surface of the receptacle rear panel **105** immediately above the center one of the mounting openings **104** by means of a rivet **136**. The retaining member **135** extends downwardly directly across the adjacent mounting opening **104** and is provided with a rearwardly extending latch projection **137**, normally extending through the associated mounting opening **104** and having a relatively flat bearing surface **138** at the upper end thereof disposed substantially normal to the main body of the retaining member **135**. The bottom end **139** of the retaining member **135** extends downwardly beyond the bottom edge of the associated mounting opening **104** along the inner surface of the receptacle rear panel **105**. The retaining member **135** is normally biased into a retaining position illustrated in solid lines in FIG. **5**, with the upper portion and the bottom end **139** thereof lying flat against the inner surface of the receptacle rear panel **105**, and with the latch projection **137** extending downwardly and rearwardly through the associated mounting opening **104** a predetermined short distance. When a forwardly directed force is applied to the projection **137**, the retaining member **135** is moved forwardly, against the natural bias thereof, into a releasing position, illustrated in broken lines in FIG. **5**, with the projection **137** depressed inwardly of the receptacle rear panel **105**.

There is also provided a removable scraper member, generally designated by the numeral **140**, and generally in the form of an angle member having a length substantially equal to the width of the receptacle **100**. The scraper member **140** comprises a generally rectangular attachment flange **141**, integral at the bottom edge thereof with a generally rectangular scraper flange **142**, preferably disposed at an acute angle to the attachment flange **141**. The free edge **143** of the scraper flange **142** defines a sharp scraping edge for scraping engagement with the towel web in a manner to be described below.

The juncture between the attachment flange **141** and the scraping flange **143** defines an arcuate corner **144** of small radius. Integral with the attachment flange **141** and disposed substantially parallel thereto and offset a slight distance therefrom in the direction away from the scraping flange **143** are two mounting tabs **145**, respectively disposed adjacent to the opposite ends of the attachment flange **141**. Each of the mounting tabs **145** is generally rectangular in shape, having a width slightly less than the width of the mounting openings **104** in the receptacle **100**, and extending upwardly a slight distance beyond the free edge of the attachment flange **141**.

In use, the scraper member **140** is mounted in a scraping position on the rear panel **105** of the receptacle **100**. In this scraping position, the mounting tabs **145** are respectively received through the end ones of the mounting openings **104** in the receptacle rear panel **105** and lie against the inner surface thereof, with the attachment flange **141** of the scraper member **140** lying against the outer surface of the receptacle rear panel **105**, as is best illustrated in FIG. **6**. In order to accommodate placement of the scraper member **140** in this scraping position, the retaining member **135** is manually depressed to the releasing position thereof, as described above, to permit insertion of the mounting tabs **145** through the associated mounting openings **104**.

When the scraper member **140** is disposed in the scraping position illustrated in FIG. **6**, the retaining member **135** is released, whereupon it returns to its latching position, illustrated in solid lines in FIG. **5**, with the bearing surface **138** thereof disposed in engagement with the corner **144** on the scraper member **140** for thereby holding the scraper member **140** in its scraping position. It will be noted that, when the scraper member **140** is disposed in its scraping position, as illustrated in FIGS. **5** and **6**, the engagement of the mounting tabs **145** against the inner surface of the receptacle rear panel **105** prevents the scraper member **140** from pivoting forwardly from its scraping position, while the latch projection **137** on the retaining member **135** prevents the scraping member **140** from sliding downwardly from the scraping position. Further, it will be observed that when the scraper member is in its scraping position, the attachment flange **141** and the mounting tabs **145** thereof cooperate to snugly grip the adjacent portions of the receptacle rear panel **105** therebetween, for thereby preventing any pivotal movement of the scraper member **140** during the scraping operation. When it is desired to remove the scraper member **180** from the receptacle **100** for cleaning or servicing, the retaining member **135** is again manually depressed to its releasing position, thereby disengaging the projection **137** from the scraper member **140** and permitting ready removal thereof from the receptacle **100**.

The operation of the improved towel dispensing cabinet will now be described. In the ordinary process of loading the cabinet, the upper door **20** is unlocked by means of a conventional locking mechanism (not shown) and is then pivoted outwardly and upwardly on the hinges **21** to an open position. The receptacle **100** is then moved to the loading position thereof whereupon the entire interior of the cabinet is then exposed. A

supply roll of clean towel **80** may then be placed in the receptacle **100** so that the roll **80** will rotate in a clockwise direction as viewed in FIG. **1** as the outer web **81** of the towel is drawn upwardly. The outer web **81** of the clean towel is then fed from the roll **80** over the flange **124** on the receptacle cover **120** and thence to the measuring roll **50**. In order to feed the outer web **81** of the clean towel between the surfaces of the measuring roll **50** and the pinch roll **55**, the latter roll is raised upwardly a slight distance. The web **81** of the towel may then be passed over the surface of the measuring roll **50**, then wrapped around the pinch roll **55** beneath the guard plate **75**. After the web **81** of the clean towel is wrapped around the pinch roll **55** in a counterclockwise direction, as viewed in FIG. **1**, it is then pulled downwardly to form a depending loop **82** below the housing **10**. The web is then passed upwardly behind the rear panel **105** of the receptacle **100**, there being sufficient space between the rear panel **105** and the rear wall **111** of the housing **10** to pass the web of towel therebetween and back into the interior of the housing **10**. The return path of the web **81** to the interior of the housing extends between the scraping flange **132** and the removable scraper member **140**, and thence upwardly between the channel-shaped member **30** and the flanged upper end of the rear panel **105** and thence to the take-up roll **65**. The channel-shaped member **30** and the rear panel **105** cooperate to define a sinuous portion of this return path, with the knee **108**, the rounded end **35** of the leg **34**, the rounded end of the flange **109**, and the rounded end **33** of the upper leg **32** defining a plurality of breaker or smoothing edges contacting the soiled towel in the return path and smoothing it to facilitate rewinding on the take-up roll **65**.

When the loading operation is started, it is advisable to lift the soiled towel take-up roll **65** out of engagement with the take-up drive roll **60**. The web **81** of the clean towel is then pulled upwardly and manually wound in a counterclockwise direction, as viewed in FIG. **1**, around the take-up roll **65**. When the web **81** of the clean towel is thus securely wrapped around the take-up roll **65**, the latter roll is lowered and placed on the take-up drive roll **60** in the normal first position thereof with the trunnions **68** of the take-up roll **65** in engagement with the rear guides **66**, as previously described. The amount of towel forming the loop **82** below the cabinet is determined at this time and will remain substantially constant as the towel is subsequently dispensed and taken up by the dispensing and take-up mechanisms supported in the housing **10**. The receptacle **100** may now be moved to the dispensing position thereof and the upper door **20** may be lowered to the closed position thereof and locked. It should be noted, that when the receptacle **100** is returned to the dispensing position thereof, the knee **108** and the flange **109** will press the web **81** of the towel in the return path thereof against the smoothing edges **33** and **35**, and will cooperate therewith to provide a reversed bend in the soiled towel return path and to function as a towel breaker so that the used or soiled towel passing to the take-up roll **65** will be flat and free of wrinkles and folds.

The measuring roll **50** and the take-up drive roll **60** are interconnected (by means not shown) to effect simultaneous rotation thereof. Further, appropriate control means are provided in the housing **10** for controlling the rotation of the measuring roll **50** and take-up drive roll **60**. This control means limits rotation of the measuring roll **50** to a predetermined distance for each dispensing operation and includes time delay means to lock the measuring roll **50** against further rotation until a predetermined time has elapsed. The construction and operation of all of this connecting and controlling apparatus is disclosed in detail in the aforementioned U.S. Pat. No. 2,899,251.

When a user pulls down on the web **81** of a clean towel forming a loop **82** exposed in front of and below the housing, the downward pull thus applied causes the pinch roll **55** to revolve in a counterclockwise direction, as indicated by the arrow in FIG. **1**, and simultaneously to press down on the surface of the measuring roll **50** with the towel web **81** therebetween, thereby causing the measuring roll **50** to revolve in a clockwise direction, as shown in FIG. **1**. Due to the interconnection between the measuring roll **50** and the take-up drive roll **60**, the latter roll is simultaneously rotated in a clockwise direction. Since the take-up roll **65** is resting on the upper surface of the take-up drive roll **60**, it rotates in a counterclockwise direction to take up substantially the same amount of towel as is dispensed from the supply roll **80** by the measuring roll **50** during each dispensing operation. The control mechanism limits the length of towel which may be dispensed in a single operation to a predetermined amount and locks the dispensing apparatus against further dispensing until a predetermined time has elapsed, after which another dispensing operation may be performed.

It has been found that, in certain applications of the dispensing cabinet of this invention, the towel **80** accumulates an unusual amount of particulate matter through use. For example, in meat-packing plants, the soiled towel carried particles into the housing **10**, which particles upon being loosened by the smoothing edges **33**, **35**, **108** and **109**, sometimes fall into the receptacle **100** and onto the clean towel **80** and there promote bacterial action that may contaminate the clean towel. In order to prevent such contamination, the cover or guard plate **120** was provided in the aforementioned copending application Ser. No. 8,125, now U.S. Pat. No. 3,637,275. It will be noted that, when the receptacle **100** is in the dispensing position thereof, as indicated in FIG. **1**, the take-up roll **65**, the smoothing edge **33**, and the portion of the soiled towel return path therebetween overlie the open-top clean towel receptacle **100**. Further, it will be noted that a gap exists between the rear edge of the roller guide **70** and the smoothing edge **33** which permits the passage of particles therethrough from the smoothing edges or directly from the soiled towel into the receptacle **100**. Therefore, the cover or guide plate **120** was provided to bridge this gap and to substantially close the open top of the receptacle **100**. When the guide plate **120** is in the closed configuration thereof, the flanges thereon directly overlie the flanges **113** on the upper edge of the receptacle end walls **112** so that the portion of the receptacle between the flange **124** of the cover **120** and the rear panel **105** is completely closed to access by particulate matter from above the receptacle **100**.

More specifically, soil particles falling from the soiled towel return path or from the smoothing edges will fall upon the rear portion **121** of the guard plate **120**. Because of the incline of this rear portion **121**, particles will tend to roll off the rear edge thereof and outside the receptacle **100**. Should any particles, through vibration of the dispensing cabinet, find their way to the forward portion **122** of the cover plate **120**, they are trapped in the trough formed by the flange **124** and are prevented from falling into the receptacle **100**. Furthermore, any particles which may fall from the side edges of the guard plate **120** are prevented from entering the receptacle **100** by the side plates **125** and the flanges thereof, the latter flanges respectively overlapping the flanges **113** on the receptacle end walls and cooperating therewith to divert particles to the exterior of the receptacle **100**.

When the receptacle **100** is in the dispensing position thereof shown in FIG. **1**, the cover plate **120** is prevented by the roller shield **70** from pivoting to the open configuration thereof, the roller shield **70** also serving to prevent the cover plate **120** from coming in contact with the measuring roll **50** and take-up drive roll **60** and thereby interfering with the operation thereof or contaminating clean towel in contact with the measuring roll **50**. In addition, it will be noted that the guard plate **75** cooperates with the roller shield **70** to effectively isolate the measuring roll **50** and the pinch roll **55** from the take-up drive roll **60** and take-up roll **65**, to further prevent soil particles which may be present in the take-up apparatus from coming into contact with the dispensing apparatus and the portion of the clean towel web extending therethrough.

However, in order to most effectively prevent soil particles from contaminating the clean towel supply within the dispensing cabinet, it has been found advantageous to remove the soil particles from the soiled towel web before the soiled towel is taken up into the dispensing cabinet. This particular removal operation is performed by the scraper mechanism **130** of the present invention. Thus, it will be noted that when the removable scraper member **140** is mounted in its scraping position on the receptacle **100** and the receptacle **100** is disposed in its dispensing position, illustrated in FIG. **1**, the scraping blade **143** of the scraper member **140** is spaced a slight distance above and in overlapping relationship with the scraper blade **133** on the rear wall **11** of the housing **10**. In this configuration, the scraper blades **132** and **142** cooperate to deflect the towel web in the lower portion of its return path **83**, with the scraping edges **133** and **143** respectively disposed in scraping engagement with the opposite sides of the soiled towel web. Thus, as the soiled towel web is pulled up into the housing **10** by the take-up mechanism, it is scraped over the scraping edges of the scraping blades **132** and **142**, thereby to effectively loosen and remove soil particles therefrom before they reach the upper portion of the return path **83** above the receptacle **100**.

It will periodically be necessary to clean the scraping blades **132** and **142**, in which case it is necessary only to remove the removable scraper member **140** in the manner described above, whereby the scraper member **140** can easily be cleaned and access to the fixed scraper blade **133** for cleaning thereof is greatly facilitated. In this connection, it will also be noted that the removable scraper member **140** is mounted closely adjacent to the open bottom of the housing **10**, whereby it is readily accessible through the open bottom for removal or replacement. Any particles which are not removed by the scraping mechanism **130**, will, of course, still be prevented by the roller shield **70** and the guard plate **75** and the receptacle cover **120** from coming in contact with and contaminating the clean towel supply in the manner described above.

When the roll of clean towel has been exhausted, the receptacle **100** may be pivoted to the loading position thereof and the upper door **20** may be moved to the open position thereof. In this position, the cover plate **120** may be cleaned of any particles which may have accumulated thereon, after which the cover plate **120** may be moved to the open configuration thereof to facilitate loading a new clean towel supply into the receptacle **100**. After removal of the soiled towel and insertion of a new roll of clean towel, the receptacle cover **120** may be returned to the closed configuration thereof, whereupon the clean towel is rethreaded through the dispensing and take-up apparatus and the receptacle **100** is returned to the dispensing position thereof.

While in the preferred embodiment of the present invention, illustrated in the drawings, there have been provided three mounting openings **104**, two mounting tabs **145** and a single retaining member **135**, it will be appreciated that any other convenient number of mounting openings, mounting tabs and retaining members may advantageously be provided. Similarly, the placement of the mounting openings **104** and the retaining members **135** may be varied, as desired.

From the foregoing, it can be seen that there has been provided an improved towel dispensing cabinet of the continuous type with a plurality of sanitary features all cooperating to effectively prevent contamination of the clean towel supply by soil particles on the soiled towel.

More particularly, there has been provided a scraper mechanism for scraping soil particles from the soiled towel before it is taken up into the dispensing cabinet. In addition, there has been provided a scraper mechanism which includes a fixed scraping blade on the rear wall of the dispenser housing and a removable scraper blade detachably mounted in the rear panel of the clean towel receptacle, these two scraping blades respectively disposed in use in scraping engagement with the opposite sides of the soiled towel.

Finally, there has been provided a scraping mechanism of simple and economical construction which affords ready access thereto for cleaning or other maintenance.

While there has been described what is at present considered to be the preferred embodiment of the invention, it will be understood that various modifications may be made therein and it is intended to cover in the appended claims all such modifications as fall within the true spirit and scope of the invention.

What is claimed is:

1. A towel dispenser of the continuous type comprising a housing having a dispensing opening therein and having associated therewith a loop of towel that extends along an exit path through the dispensing opening

to an exposed position accessible to a user and thence along a return path into said housing, a receptacle mounted in said housing and having an access opening therein for accommodating therein a supply of clean towel, towel dispensing apparatus mounted in said housing for dispensing clean towel from said receptacle through said dispensing opening into the loop along the exit path when the accessible portion of the loop is pulled by a user, loop takeup means mounted in said housing and coupled to said dispensing apparatus for retracting and storing soiled towel from the return path, said takeup means and an upper portion of the return path overlying a portion of said receptacle, and scraper mechanism carried by said housing below said access opening and said dispensing apparatus along a lower portion of the return path, said scraper mechanism having a sharp scraping blade disposed in use for engaging and scraping the soiled towel to remove soil particles therefrom before reaching the upper portion of the return path, whereby soil particles which may be carried by the soiled towel along the return path are prevented from falling into said receptacle and said dispensing apparatus and contaminating the clean towel therein.

2. The towel dispenser set forth in claim 1, wherein said receptacle has an open top defining said access opening, said scraper mechanism being disposed adjacent to the bottom of said receptacle.

3. The towel dispenser set forth in claim 1, wherein said housing has an open bottom, said scraper mechanism being disposed adjacent to the open bottom of said housing to facilitate access thereto.

4. A towel dispenser of the continuous type comprising a housing having a dispensing opening therein and having associated therewith a loop of towel that extends along an exit path through the dispensing opening to an exit path through the dispensing opening to an exposed position accessible to a user and thence along a return path into said housing, a receptacle mounted in said housing and having an access opening therein for accommodating therein a supply of clean towel, towel dispensing apparatus mounted in said housing for dispensing clean towel from said receptacle through said dispensing opening into the loop along the exit path when the accessible portion of the loop is pulled by a user, loop takeup means mounted in said housing and coupled to said dispensing apparatus for retracting and storing soiled towel from the return path, said takeup means and an upper portion of the return path overlying a portion of said receptacle, and two spaced-apart scraping members carried by said housing below said access opening and said dispensing apparatus along a lower portion of the return path and extending generally toward each other, each of said scraping members having a sharp scraping blade disposed in use for engaging and scraping the soiled towel to remove soil particles therefrom before reaching the upper portion of the return path, whereby soil particles which may be carried by the soiled towel along the return path are prevented from falling into said receptacle and said dispensing apparatus and contaminating the clean towel therein.

5. The towel dispenser set forth in claim 4, wherein each of said scraping members comprises a flat plate disposed substantially normal to the return path and extending thereinto, whereby said scraping members engage and deflect the adjacent portion of the soiled towel to define an inclined portion of the return path.

6. The towel dispenser set forth in claim 4, wherein said two scraping members are respectively carried by said receptacle and the adjacent portion of said housing.

7. The towel dispenser set forth in claim 4, wherein said two scraping members are respectively carried by said receptacle and the adjacent portion of said housing, the scraping member carried by said receptacle being disposed above the scraping member carried by the adjacent portion of said housing.

8. The towel dispenser set forth in claim 4, wherein one of said scraping members is detachably carried by said housing.

9. A towel dispenser of the continuous type comprising a housing having a dispensing opening therein and having associated therewith a loop of towel that extends along an exit path through the dispensing opening to an exposed position accessible to a user and thence along a return path into said housing, an open-top receptacle mounted in said housing for accommodating therein a supply of clean towel, said housing having a rear wall spaced rearwardly from the rear of said receptacle for defining therebetween a lower portion of the return path, towel dispensing apparatus mounted in said housing for dispensing clean towel from said receptacle through said dispensing opening into the loop along the exit path when the accessible portion of the loop is pulled by a user, loop takeup means mounted in said housing and coupled to said dispensing apparatus for retracting and storing soiled towel from the return path, said takeup means and an upper portion of the return path overlying a portion of said receptacle, a first scraping member detachably mounted on the rear of said receptacle and extending rearwardly therefrom, and a second scraping member carried by said rear wall of said housing and extending forwardly therefrom adjacent to and spaced from said first scraping member, said first and second scraping members being disposed below said dispensing apparatus and the open top of said receptacle, each of said first and second scraper mechanisms having a sharp scraping blade disposed in use for engaging and scraping the soiled towel to remove soil particles therefrom before reaching the upper portion of the return path, whereby soil particles which may be carried by the soiled towel along the return path are prevented from falling into said receptacle and said dispensing apparatus and contaminating the clean towel therein.

10. The towel dispenser set forth in claim 9, wherein said second scraping member is integral with the bottom edge of said rear wall of said housing.

11. The towel dispenser set forth in claim 9, wherein said second scraping member is integral with the bottom edge of said rear wall of said housing, said first scraping member being disposed above said second scraping member.

12. The towel dispenser set forth in claim 9, wherein said housing has an open bottom, said first scraping member being disposed adjacent to the open bottom of said housing to facilitate attachment and removal of said first scraping member through said open housing bottom.

13. A towel dispenser of the continuous type comprising a housing having a dispensing opening therein and having associated therewith a loop of towel that extends along an exit path through the dispensing opening to an exposed position accessible to a user and thence along a return path into said housing, an open-top receptacle mounted in said housing and having a mounting opening therein adjacent to the lower rear end thereof, said housing having a rear wall spaced rearwardly from the rear of said receptacle for defining therebetween a lower portion of the return path, towel dispensing apparatus mounted in said housing for dispensing clean towel from said receptacle through said dispensing opening into the loop along the exit path when the accessible portion of the loop is pulled by a user, loop takeup means mounted in said housing and coupled to said dispensing apparatus for retracting and storing soiled towel from the return path, said takeup means and an upper portion of the return path overlying a portion of said open-top receptacle, a first scraping member having a sharp scraping blade and a mounting tab thereon, said first scraping member having a scraping position with said mounting tab received in said mounting opening and said scraping blade extending rearwardly from said receptacle, retaining means engaging said first scraping member in the scraping position thereof for releasably holding said first scraping member in said scraping position, and a second sharp scraping blade carried by said rear wall of said housing and extending forwardly therefrom adjacent to and spaced from said first scraping blade, said first and second scraping blades being disposed below said dispensing apparatus and the open top of said receptacle for engaging and scraping the soiled towel to remove soil particles therefrom before reaching the upper position of the return path, whereby soil particles which may be carried by the soiled towel along the return path are prevented from falling into said receptacle and said dispensing apparatus and contaminating the clean towel therein.

14. The towel dispenser set forth in claim 13, wherein said receptacle is provided with three mounting openings therein, said first scraping member having two mounting tabs thereon respectively receivable in two of said mounting openings, said retaining means being secured to the inner surface of said receptacle and extending through the third mounting opening for engagement with said first scraping member.

15. The towel dispenser set forth in claim 13, wherein said receptacle is provided with three mounting openings therein, said retaining means comprising a resilient member secured to the inner surface of said receptacle and extending across one of the mounting openings therein, said resilient member having a latch projection thereon extending through said one mounting opening for engagement with said first scraping member in the scraping position thereof, said projection being resiliently depressable into said receptacle through said one mounting opening to accommodate insertion of said mounting tab in and removal of said mounting tabs from said one of said mounting openings.

16. A towel dispenser of the continuous type comprising a housing having an opening therein and having associated therewith a loop of towel that extends along an exit path through the opening to an exposed position accessible to a user and thence along a return path into the housing, an open-top receptacle mounted in said housing for accommodating therein a supply of clean towel, towel dispensing apparatus mounted in said housing for dispensing clean towel from said receptacle through said opening into the loop along the exit path when the accessible portion of the loop is pulled by a user, loop takeup means mounted in said housing and coupled to said dispensing apparatus for retracting and storing soiled towel from the return path, said takeup means and an upper portion of the return path overlying a portion of said open-top receptacle, a shield member mounted in said housing adjacent to said dispensing apparatus and said takeup means and shaped and arranged substantially to separate said dispensing apparatus and said takeup means from said receptacle, a guard member mounted in said housing adjacent to said dispensing apparatus and shaped and arranged for cooperation with said shield member substantially to separate said dispensing apparatus from said takeup means, a receptacle cover mounted in said housing and disposed in use between said takeup means and said open-top receptacle and being shaped and arranged substantially to close at least the portion of said receptacle underlying said takeup means and the upper portion of the return path, and scraper mechanism carried by said housing below said access opening and said dispensing apparatus, said scraper mechanism having a sharp scraping blade disposed in use for engaging and scraping the soiled towel to remove soil particles therefrom before reaching the upper portion of the return path, whereby said scraping mechanism cooperates with said shield member and said guard member and said receptacle cover for preventing soil particles which may be carried by the soiled towel along the return path from falling into said receptacle and said dispensing apparatus and contaminating the clean towel therein.

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