

# **21-C Conveyor**

## **Operation and Maintenance Manual**

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## Precautionary Steps

1. Housing doors must be in place when conveyor is in operation in order to prevent bodily injury to operating personnel.

**Conveyor must NOT be operated without housing doors in place.**

2. Turn conveyor circuit breaker **OFF** when performing maintenance on equipment. Since equipment acts as a conductor of electricity, respect all grounding and bonding codes.
3. When inspecting operation of conveyor, keep away from pulleys, motors, etc.
4. **A word to the wise!** Limit switches supplied with equipment are there for specific purposes: such as safety, tray control, wear prevention, etc. Circumventing the operation of these switches can cause personal injury and conveyor damage, and may void warranty and manufacturer's liability.
5. Conveyor wiring is water-tight but **will not withstand direct hosing down of electrical parts**. Such hosing is hazardous to operating personnel; it will cause severe damage to the equipment resulting in costly repairs and long periods of down time, and will void the warranty
6. When the conveyor is off, rotating the motor by hand can cause damage to electrical controls if the motor leads remain attached.
7. **Important:**  
Detergent or disinfectants containing chlorine, ammonia or iodine must **not** be used on the Caddy non-steel components. Use of these chemicals will cause serious deterioration of plastic parts, and most importantly the belt itself.

## CAUTION

- **Never place your hands where you cannot see them!**
- **Do not place your hands anywhere in the belt drive area!**
- **Do not spray water directly onto motor, wires or any electrical parts.**
- **Do not block limit switches with an object in order to stop conveyor! If trays are coming too fast, slow the conveyor down!**
- **Do not permit materials to clog drains!**

## Installation Instructions

This system must be installed and serviced by qualified electrical maintenance personnel familiar with electrical and mechanical systems. This manual is designed to give general information on the electrical and mechanical operation of this conveyor system. The system must be installed as per the applicable electrical codes.”

The following Grounding Instructions are dependant upon the ratings and power connection of each system.

### **GROUNDING INSTRUCTIONS (Any permanently connected systems)**

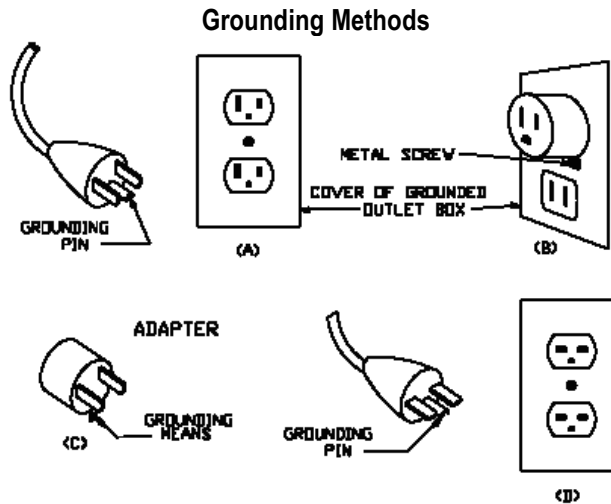
This appliance must be connected to a grounded, metal, permanent wiring system; or an equipment-grounding conductor must be run with the circuit conductors and connected to the equipment-grounding terminal or lead on the appliance.

### **GROUNDING INSTRUCTIONS (Systems rated 120 V, 15 A or less; cord connected)**

This appliance must be grounded. In the event of malfunction or breakdown, grounding provides a path of least resistance for electric current to reduce the risk of electric shock. This appliance is equipped with a cord having an equipment-grounding conductor and a grounding plug. The plug must be plugged into an appropriate outlet that is properly installed and grounded in accordance with all local codes and ordinances.

**DANGER** - Improper connection of the equipment-grounding conductor can result in a risk of electric shock. The conductor with insulation having an outer surface that is green with or without yellow stripes is the equipment-grounding conductor. If repair or replacement of the cord or plug is necessary, do not connect the equipment-grounding conductor to a live terminal. Check with a qualified electrician or serviceman if the grounding instructions are not completely understood, or if in doubt as to whether the appliance is properly grounded. Do not modify the plug provided with the appliance – if it will not fit the outlet, have a proper outlet installed by a qualified electrician.

This appliance is for use on a nominal 120 V circuit, and has a grounding plug that looks like the plug illustrated in sketch A in the following figure. A temporary adaptor, which looks like the adaptor illustrated in sketches B and C, may be used to connect this plug to a 2-pole receptacle as shown in sketch B if a properly grounded outlet is not available. The temporary adaptor should be used only until a properly grounded outlet can be installed by a qualified electrician. The green colored rigid ear, lug, and the like, extending from the adaptor must be connected to a permanent ground such as a properly grounded outlet box cover. Whenever the adaptor is used, it must be held in place by the metal screw.



To Reduce the Risk of Electric Shock, this appliance has a polarized plug (one blade is wider than the other). This plug will fit in a polarized outlet only one way. If the plug does not fit fully in the outlet, reverse the plug. If it still does not fit, contact a qualified electrician to install the proper outlet. Do not change the plug in any way.

**GROUNDING INSTRUCTIONS (Systems rated more than 120V and/or more than 15 A; cord connected)**

This appliance must be grounded. In the event of malfunction or breakdown, grounding provides a path of least resistance for electric current to reduce the risk of electric shock. This appliance is equipped with a cord having an equipment-grounding conductor and a grounding plug. The plug must be plugged into an appropriate outlet that is properly installed and grounded in accordance with all local codes and ordinances.

**DANGER** - Improper connection of the equipment-grounding conductor can result in a risk of electric shock. The conductor with insulation having an outer surface that is green with or without yellow stripes is the equipment-grounding conductor. If repair or replacement of the cord or plug is necessary, do not connect the equipment-grounding conductor to a live terminal. Check with a qualified electrician or serviceman if the grounding instructions are not completely understood, or if in doubt as to whether the appliance is properly grounded. Do not modify the plug provided with the appliance – if it will not fit the outlet, have a proper outlet installed by a qualified electrician.

This appliance is for use on a circuit having a nominal rating more than 120 V (or This appliance is rated more than 15 A and is for use on a circuit having a nominal rating of 120 V), and is factory equipped with a specific electric cord and plug. No adapter should be used with this appliance. If the appliance must be reconnected for use on a different type of electric circuit, the reconnection should be made by qualified service personnel; and after the reconnection, the appliance should comply with all local codes and ordinances.

## System Overview - Model 21-C Conveyor

This instruction manual is specifically designed to aid in the installation and maintenance of the 21-C Caddy Conveyor system.

Simplicity of design, in this Conveyor model, eliminates the need for much of what would be described as routine maintenance procedures. There are no drive shafts, sprockets or conventional bearings to adjust or lubricate. Simple care and cleaning, with a mild detergent, is all that is necessary to insure proper operation.



The 21-C is made of two separate DURA-SAN belts, driven directly from the same gearbox. The belt runs through a series of pulleys that smoothly guide the belt while holding it firmly in place. The pulleys have sealed stainless steel bearings that require little lubrication. The belt is circular in profile. The circular shape fits well into the grooved pulleys and provides a tight fit with no slippage, when properly adjusted. The belt is fused using an overlapping belt splicing tool, making it one continuous belt.

The DURA-SAN belt has outstanding tensile strength, flex-life and resistance to wear. The DURA-SAN belt, as well as other items made with base plastic or poly material, can be subject to attack by chemical agents. Cleaning agents containing ammonia, chlorine, bleach, quating agents or other harsh chemicals must be avoided. **Use of these products can cause belt damage and will void the warranty.**

**Caddy Corporation recommends** cleaning the 21-C Conveyor with the following:

- Ivory liquid (1% solution).
- Tide detergent (1% solution).
- Any comparably mild detergent.

**Then rinse with copious amounts of water.**

## Important Cleaning Information

**Cleaning:** The conveyor must always be in the off position while cleaning the conveyor. Clean the bed surface with a mild soap and water. Always rinse the belts thoroughly after washing. Remove all covers for cleaning. The tail cover should be removed at least weekly for cleaning around the tail pulleys. Also a light oil should be applied to the pulley bearings after cleaning.

**Conveyor must not be operated without the covers in place.**

The turn covers, (if applicable), should also be removed weekly or as needed, for cleaning. This is very important because without the proper cleaning of the turn pulleys they will become clogged with dirt and cease to rotate, putting additional strain on the belts. The turn covers are removed by loosening the four screws and removing the two drive belts (the exposed belts), from the grooves in the turn cover. After cleaning, reinstall covers prior to start-up.

**Do not operate conveyor without the tail turn cover in place.**

### **NOTICE**

The use of cleaning agents containing AMMONIA, CHLORINE, and BLEACH as well as QUAT agents  
**MUST BE AVOIDED**

The use of cleaning agents containing the chemicals listed above will damage any product made of Plastic.

### **CAUTION**

The use of abrasive cleaners when cleaning the conveyor, such as Comet, Dutch Cleanser or any other gritty compound will damage the stainless steel.

Damage caused by these cleaning agents may not become apparent for several months. Their use will void the warranty and any necessary repairs will be charged to the user.

A good method of determining if a cleanser can be used on the conveyor is to dissolve a cup of it in a bucket of water. If the cleanser does not dissolve completely it will damage the conveyor.

**Adjustments:** The DURA-SAN belt has an inner cord of many strands that seriously limit stretch. However, over a period of time some adjustment may be necessary. Caddy Corporation has allowed for this stretch with two adjusting points. The primary slack adjusting point is under the tail cover. The tail cover is secured by one screw. After the screw is removed and the cover is lifted off, two pulleys with threaded rods will be obvious. With the conveyor in the **OFF** position, to increase tension on the belts simply tighten the lock nuts until desired tension is achieved.

Be careful not to over tighten the belts, the threaded rod should not be moved more than half an inch at one time. If you require more adjustment than half an inch, there may be another problem. Call the Caddy Corporation Service Department (856-467-4222 ext. 331) with any questions.

The second slack adjustment point is at the pulleys in the motor compartment. There are two pulleys mounted on the top of the gear box. These pulleys can be moved up in three steps increasing tension on the belts.

The adjustment at the tail should be maximized prior to moving the pulleys in the motor compartment. When it becomes necessary to move the adjustment pulleys in the motor compartment, relax the tension adjustment at the tail, make the adjustment in the motor compartment then reapply tension at the tail, as needed.

**Caution: The use of cleaning agents containing ammonia, chlorine or bleach should be avoided.**

**Lubrication:** There are no grease fittings anywhere on this conveyor. A light oil (3 in 1 oil or sewing machine oil) may be applied to the pulley bearings periodically. The gear box is sealed and it is seldom necessary to add gear oil. However, it is a good idea to check the oil level after the first 90 days of operation and then every three months following. Add oil as needed (Mobile 600 W cylinder oil or any equivalent gear box oil is acceptable).

**Caution: Conveyor must in the OFF position for any inspection.**

**Motor Controls:** Caddy Corporation currently provides a DC motor control (Caddy part number 6235-02). This controller offers a wide range of selections. We, for the purposes of this manual, will concern ourselves with two, speed and torque. The speed is regulated through a potentiometer which at it highest setting will run the conveyor at forty feet per minute. The speed can be reduced to whatever setting is comfortable for your operation.

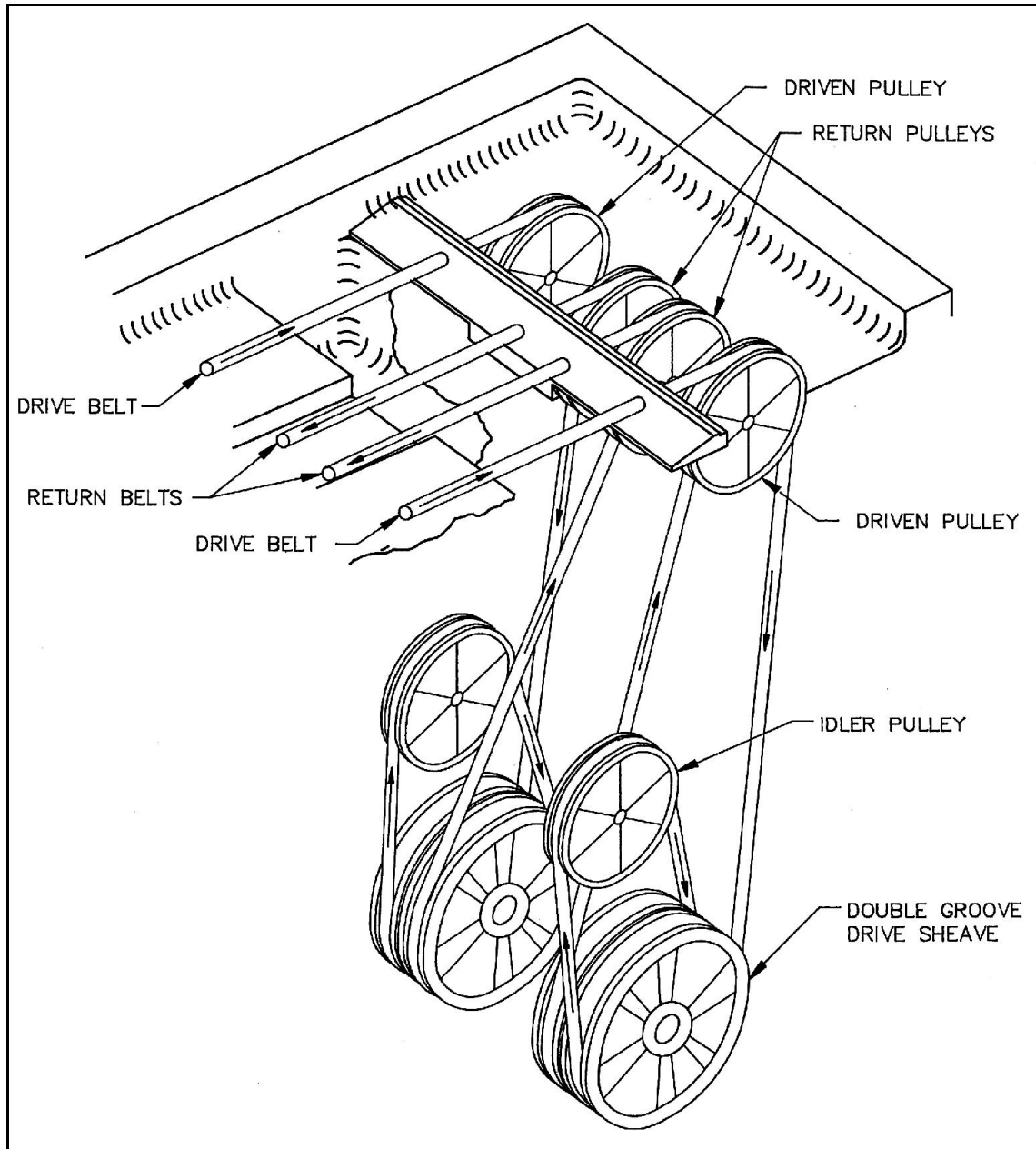
The current limit (CL/Torque adjustment) CL circuitry, is provided to protect the motor and control against overloads. The CL also limits the inrush current to a safe level during startup. The CL is factory set to approximately 1.5 times the full load rating of the motor. The trimpot is preset at the factory but may need to be adjusted, as time goes on, due to resistance build up.

The **normal Trimpot settings** are as follows, (expressed as a % of full clockwise rotation)

MIN (minimum speed):	0%
MAX (maximum speed):	60%
IR (IR compensation):	15%
CL (current limit/torque):	65%
ACCEL (acceleration start):	50%



### Lacing Instructions - Belt Assembly For 21-C Drive



## Belt Repair Tool

**The tool on this page is for repairing the ½” diameter, round, Dura-San Conveyor Belt**

### Permanent Belt Repairs

Proper splicing requires “overlapping” the two belt ends.

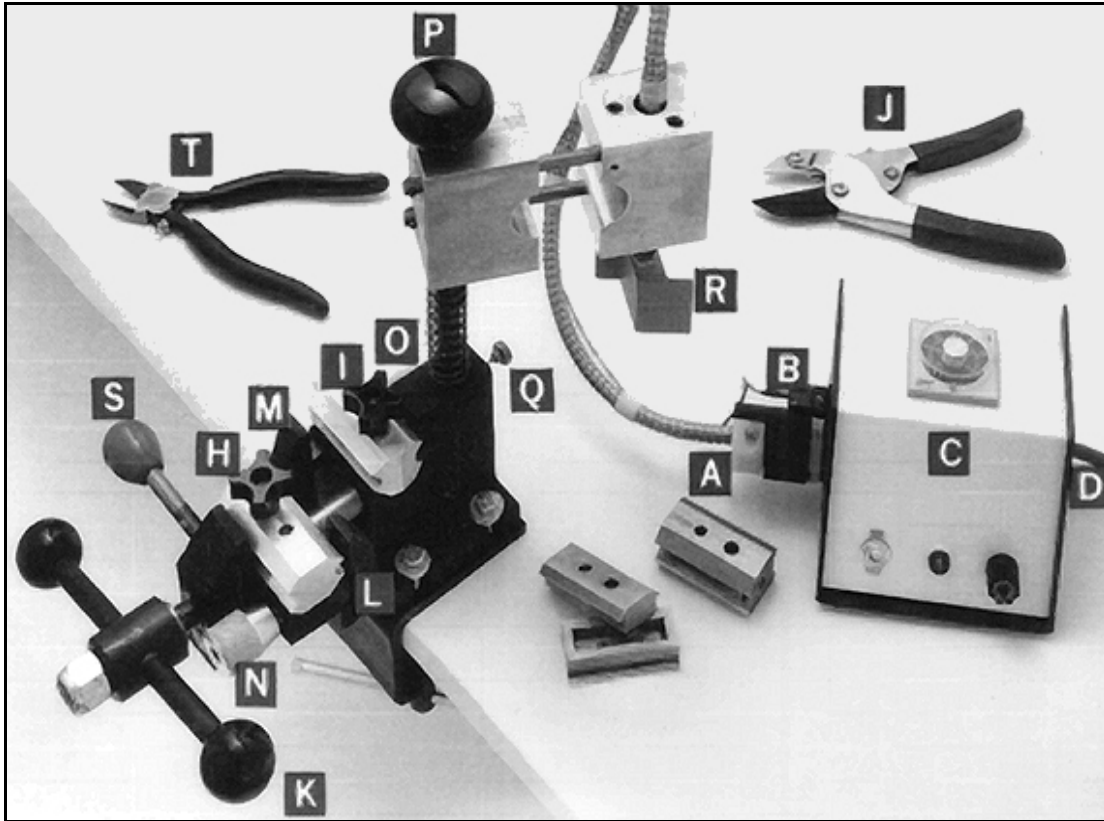
Use Caddy Overlap Belt Repair Tool #6394-03.

Please refer to:

- Nomenclature for the Overlapping Belt Splicing Tool
- Instructions for using the Overlapping Belt Splicing Tool

Contact your local service agency, or the Caddy Service Department, for additional information.

**Nomenclature for the Overlapping Belt Splicing Tool (6394-03)**



<b>A</b>	Power Cord	<b>K</b>	Capstan
<b>B</b>	Thermocouple	<b>L</b>	Holding Clamp
<b>C</b>	Control Box	<b>M</b>	Holding Clamp
<b>D</b>	Main Power Cord	<b>N</b>	Clamp Thumb Nut
<b>E</b>	Power Switch	<b>O</b>	Clamp Thumb Nut
<b>F</b>	Power Indicator Light	<b>P</b>	Heating Assembly Knob
<b>G</b>	Heating Indicator Light	<b>Q</b>	Hold Down Pin
<b>H</b>	Thumb Nut	<b>R</b>	Heating Tip
<b>I</b>	Thumb Nut	<b>S</b>	Slide Knob
<b>J</b>	Belt Shears	<b>T</b>	Flash Cutters

**Note:** Caddy Corporation recommends making a practice weld using a short piece of belt before making a final weld on the conveyor.

## Instructions for Using the Overlapping Belt Splicing Tool (6394-03)

Before attempting a splice, the belt must be cut to size. When sizing the belt, make sure that the belt is laced properly. The belt must be on each pulley so that the proper size of the belt can be determined. Once it is determined that the belt is laced properly, pull the two belt ends together, as tight as possible by hand and allow them to overlap 1 1/4 inches, then cut excess. If you do not have enough belt to overlap the 1 1/4 inches required to make a splice, a piece of belt must be added. Caddy Corporation suggests adding, at least, a ten foot piece to keep the splices that far apart. Simply add the ten foot piece and then size as indicated. Once the correct sizing has been determined, continue with the belt splicing operation.

1. Plug power cord **A** and thermocouple **B** into control box **C**. Plug main power cord **D** into electrical outlet or extension cord.
2. Set the temperature control dial (Fig. 2) to 450 degrees F. Turn on power switch **E**. Red power light **F** will remain on, indicating that there is power to the unit. Indicator light **G** will stay on while tip is heating. DO NOT start welding until this light, (indicator light **G**) goes out the first time.

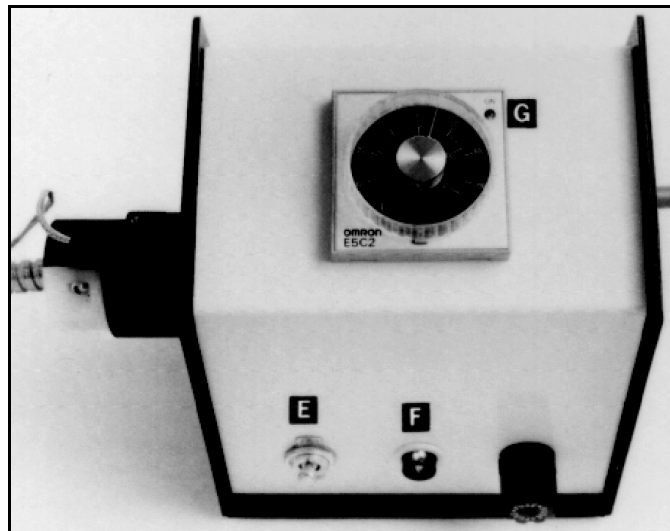
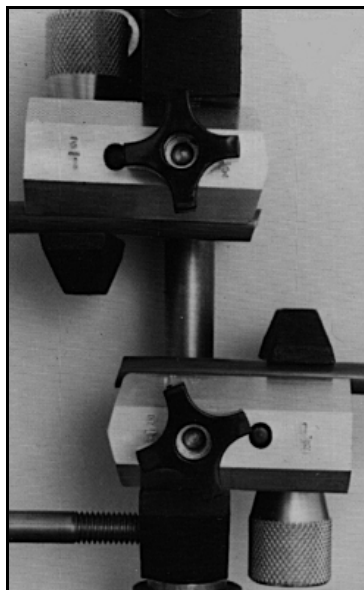
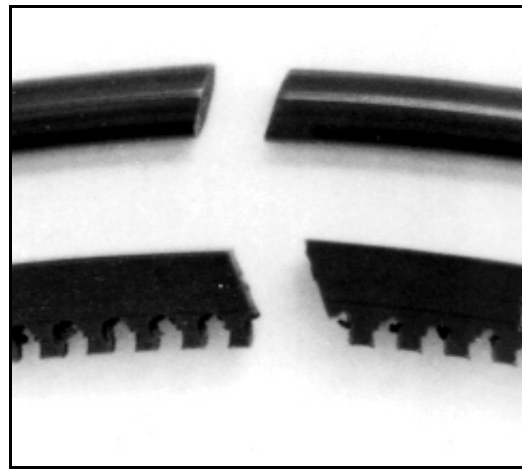
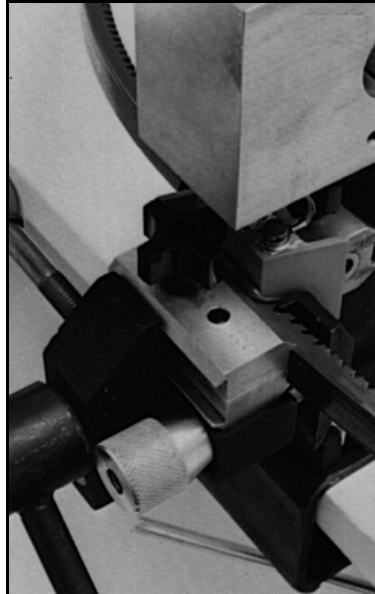


Fig. 2

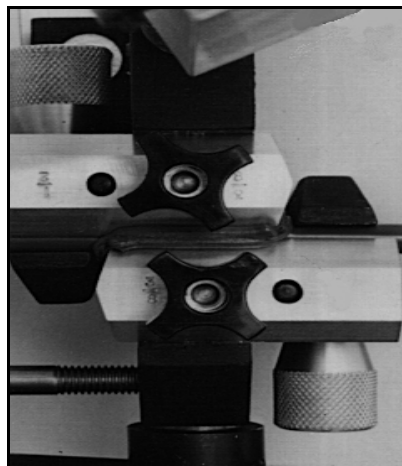
3. Using shears **J**, cut to the correct belt length and add 1½ inches for the overlap. Cut each end on approximately 25 degree opposite angles.



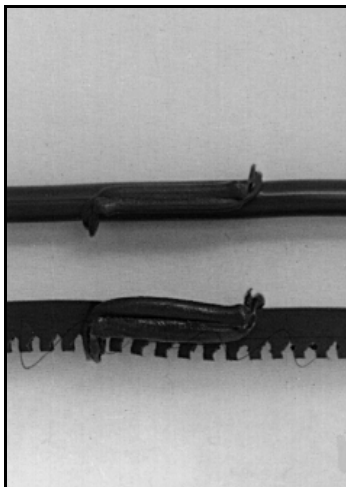
4. Screw capstan **K** all the way open. Fit the first end of the belt into the rear die. The Caddy Belt should overhang the die approximately 1/16 of an inch, and the angle on belt should line up with the angle on the die. Tighten clamp by turning thumb nut **O**. Now fit the other end of the belt into front (or sliding) die. This belt is situated exactly the same as the rear belt. **NEVER OVERHANG THE BELT MORE THAN 1/8 OF AN INCH.**



5. Position Teflon heating tip **R** above and between the dies. Push down on knob **P** and press pin **Q** in to hold heating assembly down.
6. Screw capstan **K** forward until both overlapping surfaces contact heating tip **R**. Continue turning capstan as belt ends melt. Apply just enough pressure to squeeze the melted material out of the welding area. Continue until capstan stops. **DO NOT OVER TIGHTEN.**
7. After approximately 20 seconds, loosen capstan one turn. Place left hand on side knob **S**. With your right hand pull pin **Q**, which will let the heating assembly pop up and clear the weld area. Slide the front die home immediately with slide knob **S**. Quickly spin capstan in and tighten until the stop is reached. It is **IMPORTANT** that this sequence is done quickly.



8. As weld cools use a clean, dry cloth to wipe excess material from the hot tip. **CLEAN HEATING TIP BETWEEN EVERY WELD. DO NOT SCRATCH ITS TEFLON COATING.**
9. After approximately five minutes, remove the belt from the welder.



10. Using the special flat-edged flash cutters T, trim excess material from around the weld area.

**NOTE:** These flash cutters are not standard diagonal cutters and should only be used for trimming the belt.



**NOTE:** Should the use of a Belt Tool become necessary, the Overlapping Belt Splicing Tool is available from Caddy Corporation.

**Note:** This 21-C Conveyor is not designed to convey Bus Boxes/Tote Boxes.

**Note:** The 21-C Conveyor is designed and fabricated for your specified tray size.

## Care and Cleaning of Stainless Steel Equipment

**Contrary to popular belief, stainless steels ARE susceptible to rusting and pitting.**

Corrosion on metals is everywhere. It is recognized quickly on iron and steel as unsightly yellow/orange rust. Such metals are called "active" because they actively corrode when their atoms combine with oxygen to form rust.

Stainless steels are passive metals because they contain other metals, like chromium, nickel and manganese that stabilize the atoms.

Chromium provides an invisible passive film that covers the steel's surface acting as a shield against corrosion. As long as the film is intact and not broken or contaminated, the metal is passive and stainless. If the passive film of stainless steel has been broken, equipment starts to corrode. At its end, it rusts.

### The Enemies of Stainless Steel

There are three basic things which can break down stainless steel's passivity layer and allow corrosion to occur.

1. **Mechanical Abrasion** - Steel pads, wire brushes and scrapers are prime examples of things that will scratch a steel surface.
2. **Water and Deposits** - Water has varying degrees of hardness. Depending on the area you live in, you may have hard or soft water. Hard water may leave spots, and when heated, leave deposits that will break down the passive layer and rust stainless steel. Other deposits from food preparation and service must be properly removed.
3. **Chlorides** - Chlorides are found nearly everywhere. They are in water, food and table salt. Some of the worst chloride perpetrators come from household and industrial cleaners.

**Here are a few steps that can help prevent stainless steel rust and pitting.**

#### 1. Use the proper tools.

When cleaning stainless steel products, use non-abrasive tools. Soft cloths and plastic scouring pads will not harm steel's passive layer. Stainless steel pads also can be used but the scrubbing motion *must* be in the direction of the manufacturers' polishing marks.

#### 2. Clean with the polish lines

Some stainless steel comes with visible polishing lines or "grain". When visible lines are present, always scrub in a motion parallel to the lines. When the grain cannot be seen, play it safe and use a soft cloth or plastic scouring pad.

#### 3. Use alkaline, alkaline chlorinated or non-chloride containing cleaners.

While many traditional cleaners are loaded with chlorides, the industry is providing an ever-increasing choice of non-chloride cleaners. If you are not sure of chloride content in the cleaner used, contact your cleaner supplier. If your present cleaner contains chlorides, ask your supplier if they have an alternative. Avoid cleaners containing quaternary salts; they can attack stainless steel and cause pitting and rusting.

#### 4. Treat your water.

Though this is not always practical, softening hard water can do much to reduce deposits. There are certain filters that can be installed to remove distasteful and corrosive elements. To insure proper water treatment, call a treatment specialist.



**5. Keep your food equipment clean.**

Use alkaline, alkaline chlorinated or non-chloride cleaners at recommended strength. Clean frequently to avoid build-up of hard, stubborn stains. If you boil water in stainless steel equipment, remember the single most likely cause of damage is chlorides in the water. Heating cleaners that contain chlorides have a similar effect.

**6. Rinse, rinse, rinse.**

If chlorinated cleaners are used, rinse and wipe equipment and supplies dry immediately. The sooner you wipe off standing water, especially when it contains cleaning agents, the better. After wiping equipment down, allow it to air dry; oxygen helps maintain the stainless steel's passivity film.

**7. Never use hydrochloric acid (muriatic acid) on stainless steel.****Review**

- Stainless steels rust when passivity (film-shield) breaks down as a result of scrapes, scratches, deposits and chlorides.
- Stainless steel rust starts with pits and cracks.
- Use the proper tools. Do not use steel pads, wire brushes or scrapers to clean stainless steel.
- Use non-chlorinated cleaners at recommended concentrations. Use only chloride-free cleaners.
- Soften your water. Use filters and softeners whenever possible.
- Wipe off cleaning agents and standing water as soon as possible. Prolonged contact eventually causes problems.

## WARRANTY

Products manufactured by Caddy Corporation are warranted to the original purchaser as follows:

Mechanical components are warranted to be free from defects in material and workmanship under normal use, storage and service for a period of one year from the date of installation or eighteen months from factory shipment, whichever occurs first.

Electrical components are warranted to the original purchaser to be free from defects in material and workmanship under normal use, storage and service for a period of ninety days from the date of shipment.

Caddy Corporation shall repair or replace, at our discretion, any part or product which we determine to be defective during the warranty period.

Under no circumstances will Caddy Corporation honor any repair or back charges by any party regardless of whether such equipment is within the warranty period, unless the Service Department of Caddy Corporation has authorized such work in writing.

If the equipment is repaired or altered in any way whatsoever by any person without prior written consent by Caddy Corporation, this warranty shall not apply.

The following are **NOT** covered under this warranty:

- Normal wear on parts, such as bulbs, gaskets, etc.
- Defects or damages resulting from accidents, alterations, abuse or misuse of equipment and/or any of its components.
- Damage of electrical components resulting from connecting the equipment to any power supply other than specified on the nameplate, or resulting from unauthorized altering of the equipment.
- Damage from water conditions causing malfunction of electric components and/or control equipment.

There is no other express warranty.

Any and all implied warranties are excluded to the extent permitted by law. Implied warranties, when included by law, including those merchantability and fitness for a particular purpose, are limited to one year from the date of shipment.

Liability for consequential damages under any and all warranties is excluded. This warranty is the buyer's exclusive remedy.

It is Caddy's policy to constantly improve the design and manufacture of our products. Accordingly, all equipment is subject to change consistent with such policy without prior notice and some items may be discontinued without obligation.

**Parts List**
**Series 21-C Soiled Tray Conveyors**

Part Description	Part Number
Belt, Round, 1/2" Dia. Dura-San	6843-05
5" Idler Pulley	6881-01
7 1/2" Idler Pulley	6881-02
Spacer, Pulley (1 Per Idler Pulley)	6892-01
Tensioner Assembly, Tail End	6960-01
Double Drive Pulley 1" Bore (1/2 HP Motor)	6880-01
Double Drive Pulley 1 1/8" Bore (3/4 HP Motor)	6880-02
Belt Guide Short (2" Long)	6865-02
Belt Guide, Long (7" Long)	6909-01
Return Channel Cover (48" Long, 2 Finger Holes)	6885-01

**45° and 90° Turn Components**

Part Description	Part Number
21-C Turn, Drive Pulley (3 Req'd. Per 45° Turn) (6 Req'd. Per 90° Turn)	6887-01
21-C Turn, Drive Bushing (3 Req'd. Per 45° Turn) (6 Req'd. Per 90° Turn)	6889-01
21-C Turn, Return Pulley (2 Req'd. Per 45° Turn) (6 Req'd. Per 90° Turn)	6888-01
21-C Turn, Return Bushing (2 Req'd. Per 45° Turn) (6 Req'd. Per 90° Turn)	6890-01
Turn Pulley Mtg. Shaft (5 Req'd. Per 45° Turn) (12 Req'd. Per 90° Turn)	6933-01
Bolt, 1/4-20, S/S, 1/2" (5 Req'd. Per 45° Turn) (12 Req'd. Per 90° Turn)	1016-01

**Electrical Information and Parts**

See electrical drawing or contact Caddy.  
 Please have conveyor Model, Serial Number and facility location prior to contact.