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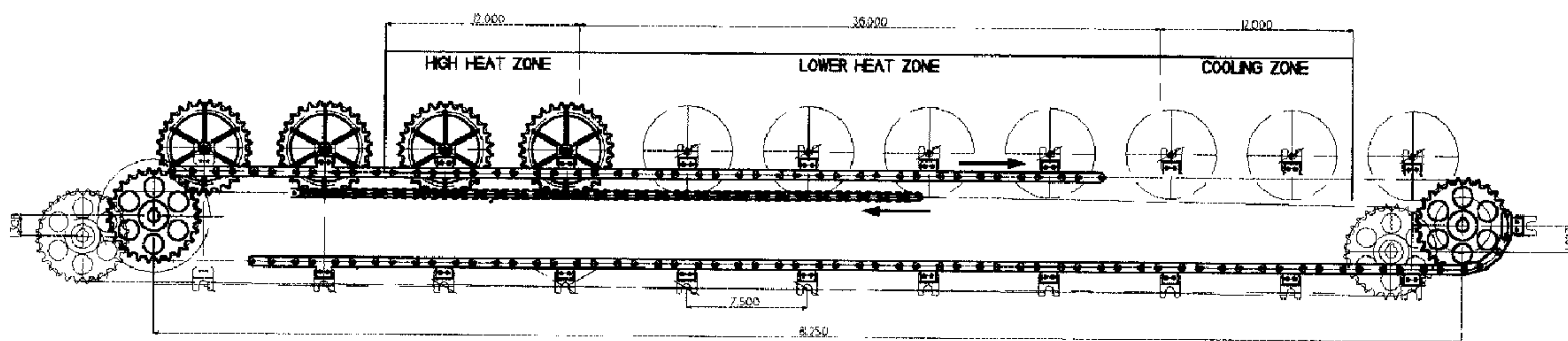
(54) Titre : GRIL «ROBOGRILL»
(54) Title: ROBOGRILL

6 MIN. COOKING TIME
COOKING DISTANCE - 4 FT
CONVEYOR SPEED - 4FT/6 MIN - .66 FPM
HIGH HEAT - 1.5 MIN
COOLING - 1.5 MIN

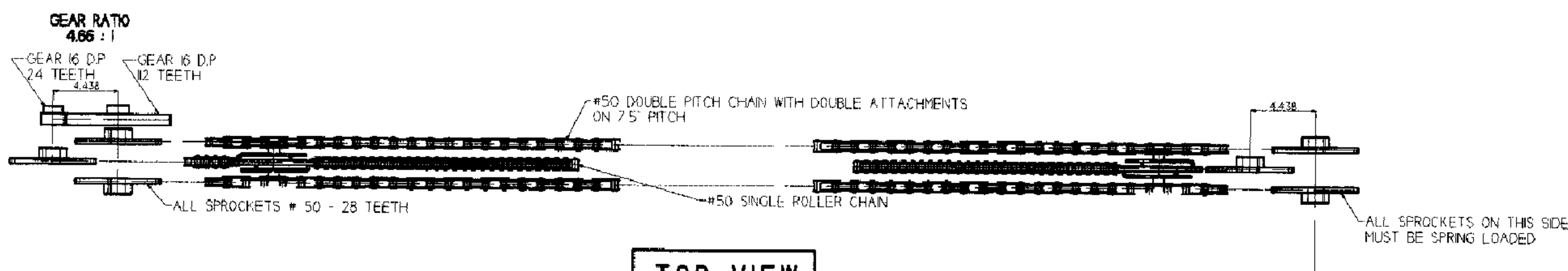
3 MIN COOKING TIME
COOKING DISTANCE - 4 FT
CONVEYOR SPEED - 4 FT/3 MIN - 1.33 FPM
HIGH HEAT - .75 MIN
COLLING - .75 MIN

CARTRIDGE - 3.8 REVOLUTIONS
PER 1 FT. OF TRAVEL

- ROBOGRILL Automated Double Motion Vertical Infrared Cooking Conveyor



SIDE VIEW



TOP VIEW

(57) Abrégé/Abstract:

This commercial cooking conveyor enables a better, faster and healthier process of cooking FOOD: HAMBURGERS, STEAKS AND THE LIKE. FOOD is not cooked flat (horizontally) as with conventional cooking methods, but sideways (vertically). FOOD is inserted into sprocket-shaped CARTRIDGES and placed on automated, double-motion, chain-driven cooking conveyor vertically, exposing both flat sides of FOOD to infrared burners powered by natural gas, propane or electricity. FOOD in CARTRIDGES undergoes the cooking cycle through three temperature zones: high, low and cooling. Infrared heat is applied

(57) **Abrégé(suite)/Abstract(continued):**

simultaneously to both sides of FOOD with controlled intensity. CARTRIDGES move through conveyor vertically, while constantly rotating. Continuous rotation of CARTRIDGES allows cooking evenly, protecting FOOD from burning or drying up. Maximum capacity of conveyor is up to ten CARTRIDGES concurrently. Speed of the conveyor, rotation of CARTRIDGES and intensity of heat in each cooking zone are adjustable. Human intervention during the cooking process is not required.

ABSTRACT OF THE DISCLOSURE

A chain grill described herein for continuously cooking food products on a chain-driven, double-motion conveyor formed of infrared burners, stainless steel food-holding cartridges, roller chains with attached cartridge slots, motorized exhaust fan, gearbox, dc motor, grease drip pans and cartridge release assembly. One set of chains provides continuous vertical rotation of cartridges, while second set of chains moves cartridges along conveyor path horizontally. Two infrared burners, powered by natural gas, propane or electricity are positioned horizontally, parallel to conveyor chains. Food products are inserted into cartridges and placed on conveyor vertically, exposing both flat sides of food products to infrared burners. Cartridges, holding food products, are continuously rotated vertically while simultaneously moved by chains along horizontal conveyor path. Infrared heat, radiating from infrared burners, is applied simultaneously to both sides of food products with the same controlled intensity. Fully cooked food products are discharged in the cartridge release assembly.

SPECIFICATION

Purpose

The purpose of this document is to provide all documentation necessary for successful filing of patent for "**ROBOGRILL**" Automated Double-Motion Vertical Infrared Cooking Conveyor designed for commercial applications. Specification of the invention consists of the **Description, Claims and Drawings** as stipulated by the Canadian Patents Act:

A. DESCRIPTION

- A1. *Title*
- A2. *Technical Field Of Invention*
- A3. *Background Of The Invention And Prior Art*
- A4. *How This Invention Addresses Several Technical Problems*
- A5. *Summary Of The Invention*
- A6. *Example Of Intended Use*
- A7. *Brief Description Of Drawings*
- A8. *Detailed Description Of The Invention*

B. CLAIMS

C. DRAWINGS

Assumptions

1. **FOOD**⁽¹⁾ – **HAMBURGERS, STEAKS AND THE LIKE** in this document include but are not limited to: **Hamburgers, Steaks, Roasts, Briskets, Chops, Ribs** as well as other **Burgers** and similar type **FOOD** made from:
 - **MEAT:** *Beef, Pork, Veal, Lamb, Bison, Ostrich and Turkey*
 - **POULTRY:** *Chicken*
 - **VEGETABLES:** *Tofu and Beans*
2. Throughout this document there is reference to "**ROBOGRILL**" Automated Double-Motion Vertical Infrared Cooking Conveyor. "**ROBOGRILL**" is the trademarked name of the actual cooking apparatus for which one of the patents is applied. "**ROBOGRILL**" is described in detail in **CLAIM # 3** of this document.

A. DESCRIPTION

A1. Title

“ROBOGRILL” Automated Double-Motion Vertical Infrared Cooking Conveyor

This commercial conveyor-type cooking apparatus enables a better, faster and healthier process of cooking *FOOD*⁽¹⁾: Hamburgers, Steaks And The Like.

FOOD⁽¹⁾ is not cooked flat (horizontally) as with conventional cooking methods, but sideways (vertically).

A2. Technical Field Of The Invention

The present invention relates to continuous cooking of *FOOD*⁽¹⁾ after it is inserted into sprocket-shaped CARTRIDGES. Cartridges, containing *FOOD*⁽¹⁾, are placed on an the automated, double-motion chain-driven cooking conveyor VERTICALLY, exposing both flat sides of *FOOD*⁽¹⁾ to infrared burners powered by natural gas, propane or electricity. Cartridges are pulled through the cooking conveyor at certain speed by means of mechanical chains, while at the same time; cartridges themselves are continuously rotating to cook *FOOD*⁽¹⁾ evenly, protecting *FOOD*⁽¹⁾ from burning or drying up.

After the cartridges containing the *FOOD*⁽¹⁾ enter the conveyor - the infrared cooking cycle is initiated. These cartridges are advanced intermittently along a vertical path of travel through three temperature zones: high heat zone, lower heat zone and finally to the cooling zone. The duration of the cooking cycle: speed of the conveyor and the rotation of the cartridges are fully adjustable and vary with the type and size of *FOOD*⁽¹⁾ being cooked.

This invention does not require any human involvement during the cooking process. The only manual operation required is to insert *FOOD*⁽¹⁾ into cartridges, place the cartridges on and remove them from the conveyor.

There are various known automatic cooking grills and similar type cooking apparatuses, which typically cook *FOOD*⁽¹⁾ one side at a time.

FOOD⁽¹⁾ – See Full Definition In Assumption

Moreover, walking beam cooking conveyors are somewhat commonplace, as is the conventional - horizontal or flat method of cooking.

However, in the field of continuous cooking of *FOOD*⁽¹⁾ for commercial applications, the **improvements** of this invention to the **process and methodology** are **novel** from several standpoints as follows:

1. By utilizing an innovative approach to position and cook *FOOD*⁽¹⁾ sideways (vertically), not flat (horizontally) as with conventional cooking methods, this invention - "***ROBOGRILL***" for commercial applications cooks *FOOD*⁽¹⁾ on both sides, at the same time, with the same controlled intensity of infrared heat.

ROBOGRILL is a unique invention because of the following characteristics:

- Employs two rows of infrared burners positioned on both sides of the conveyor to cook *FOOD*⁽¹⁾ on both sides simultaneously and faster than conventional methods of cooking.
 - Infrared cooking technology enables *searing* of *FOOD*⁽¹⁾, which reduces the levels of fats and cholesterol and produces healthier *FOOD*⁽¹⁾
 - Utilizes two sets of mechanical chains. One set of mechanical chains guides the sprocket-shaped cartridges holding the *FOOD*⁽¹⁾ in place vertically through the conveyor path. The second set of mechanical chains continuously rotate the cartridges during the full duration of the infrared cooking cycle to prevent *FOOD*⁽¹⁾ from burning or drying up.
 - The maximum capacity of the conveyor is up to ten cartridges at the same time. This means that "***ROBOGRILL***" can cook up to ten hamburgers placed in cartridges on the conveyor concurrently.
2. In order to enable a vertical method of cooking - sprocket-shaped cartridges or *FOOD*⁽¹⁾ holders were developed. These cartridges come in various sizes, depending on the type and size of *FOOD*⁽¹⁾ to be cooked.

***FOOD*⁽¹⁾ – See Full Definition In Assumption**

Some of the basic characteristics of **CARTRIDGES** can be summarized as follows:

- Cartridges hold the *FOOD*⁽¹⁾ in place and prevent *FOOD*⁽¹⁾ from falling out of the cartridge during the full duration of the cooking cycle.
- Cartridges are sprocket-shaped to enable their continuous rotation by one set of mechanical chains.
- Cartridges allow infrared heat to penetrate and cook *FOOD*⁽¹⁾ from both sides, at the same time, with the same controlled intensity of infrared heat.
- Cartridges are made of food-grade type materials that are in accordance with all stipulated food and health regulations.

A3. Background Of The Invention And Prior Art

The conventional processes of cooking *FOOD*⁽¹⁾ can be summarized in 2 parts:

- ***Conventional Cooking Processes And Methods***
- ***Apparatuses Supporting Conventional Cooking Processes and Methods***

Conventional Cooking Processes And Methods

The conventional processes and methods of cooking *FOOD*⁽¹⁾ have long been known and widely used privately by consumers and commercially by restaurants. *FOOD*⁽¹⁾ can be charbroiled, barbequed, broiled, grilled, roasted, baked or fried. But regardless of the conventional method or process utilized, *FOOD*⁽¹⁾ is always placed **horizontally or flat** on the cooking apparatus. Hamburgers, a steak, briskets, chops, ribs, etc. are placed on or in: griddles, broilers, barbeques, skillets, pans, gas grills, stoves or ovens horizontally or flat. In commercial applications it was physically impossible to cook such *FOOD*⁽¹⁾ in any other way.

Apparatuses Supporting Conventional Cooking Processes and Methods

Conventional cooking apparatus for restaurants such as commercial type gas grills; barbeques, broilers, griddles, stoves and/or ovens were designed to support only the **conventional - horizontal or flat** method of cooking.

FOOD⁽¹⁾ – See Full Definition In Assumption

PRIOR ART

Conventional processes and/or methods of cooking, as well as various conventional cooking apparatuses of similar type that support this conventional flat or horizontal method of cooking are highlighted in the following patents as outlined in the *Canadian Patents Database*:

1. CONTINUOUS COOKING GRILL

Patent #: CA 1273979
Inventor: Long, Marshall
CPC: 309/71
IPC: A47J 37/04
Issued On: Sep. 11, 1990

ABSTRACT OF THE DISCLOSURE

A cooker for continuous grilling of hamburger patties and the like uses a shiftable grid which intermittently lifts the patties off a stationary grid and offsets advancement after each lift-off until a U-shaped path is traversed extending initially through and terminating beyond one end of the cooker exteriorly thereof. The patties travel upwardly along a straight line with respect to a first pair of legs of the grids and thence upwardly and accurately with respect to a first grid quadrants, whereupon they invert and drop such as to travel upwardly and accurately with respect to a pair of second grid quadrants. Finally, the patties travel upwardly along a straight line with respect to a pair of legs of the grids forming the final stretch of the travel.

2. TWO-SIDED COOKING DEVICE FOR A GRILL

Patent #: CA 1264795
Inventors: Dorr, Richard W.
 Kalowski, Thaddeus J.
 Weimer, Ralph
 Novy, Robert A.
CPC: 309/71
IPC: A47J 37/06
Issued On: Jan. 23, 1990

ABSTRACT OF THE DISCLOSURE

A compact two-sided cooking device is disclosed for use with an existing grill to permit two-sided cooking of food products, such as hamburger patties, on a relatively limited basis. The device includes a cooking assembly having an electrically-powered cooking platen which can be selectively positioned on food products on the grill for effecting accelerated two-sided cooking thereof. The present cooking device has been particularly configured for use in conjunction with, and for rocking movement on, a commercially-sized restaurant grill, and provides greatly reduced cooking times so that a customer's order can be freshly and efficiently prepared even during relatively slow business hours.

3. APPARATUS FOR TWO-SIDED COOKING

Patent #: CA 1252302
Inventors: Bergling, Craig L.
 Ewald, Henry T
 Horton, Douglas J.
 Weller, Berthold L.
 Hoverman, James L.
CPC: 65/46
IPC: F24C 7/00; A47J 37/06
Issued On: Apr. 11, 1989

ABSTRACT OF THE DISCLOSURE

An apparatus for effecting two-sided cooking of food products, such as frozen hamburger patties, is disclosed which has been configured for highly desirable efficiency, versatility, and consistency in food product preparation. The apparatus includes a housing upon which is mounted a substantially horizontal lower platen assembly, with the apparatus further including one or more upper platen assemblies each mounted on a respective pivotal support arm for movement between a lowered inactive position and a raised active position with respect to the lower platen assembly. The apparatus includes a mounting arrangement for permitting limited relative movement of each upper platen assembly with respect to its support arm, and further includes mechanisms for maintaining a

FOOD ⁽¹⁾ – See Full Definition In Assumption

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predetermined minimum spacing between the upper and lower platens for avoiding undue compaction of the food products. Automatic controls effect upward movement of the upper platen for precise cooking control.

Other Known Conventional Processes, Cooking Methods And Apparatuses

“ROBOGRILL” Automated Double-Motion Vertical Infrared Cooking Conveyor utilizes a vertical process of cooking *FOOD*⁽¹⁾ in conjunction with various known technologies in distinct combination that make this invention unique in its class.

Amongst these known ***Conventional Processes, Cooking Methods and Apparatuses*** as filed in the *Canadian Patents Database* and used by ***“ROBOGRILL”*** in distinct combination include:

4. MEAT COOKING APPARATUS AND METHOD

Patent #: CA 1167896
Inventor: Flavan, David B., Jr.
CPC: 309/15
IPC: F24C 7/00 H05B 3/02 H05B 6/62
Issued On: May 22, 1984

5. FAT REMOVAL FROM MEAT PRODUCTS

Patent #: CA 1338414
Inventor: Margolis, Geoffrey
CPC: 99/101; 99/90
IPC: A23L 1/317
Issued On: June 25, 1996

6. INFRARED COOKING

Patent #: CA 1047307
Inventors: Kohli, Martti I.
 Callerhorn, Bo A.
 Eklund, Ernst E. F.
CPC: 99/195, 309/66
IPC: A23L 3/00, A47J 37/06
Issued On: Jan. 30, 1979

FOOD⁽¹⁾ – See Full Definition In Assumption

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Though such conventional cooking **Processes (Methods)** and **Apparatuses (Devices)** have achieved considerable popularity and commercial success, there has been a continuing need for improvement of both, which "**ROBOGRILL**" Automated Double-Motion Vertical Infrared Cooking Conveyor accomplishes.

A4. How This Invention Addresses A Technical Problem

Conventional cooking equipment such as griddles, broilers, barbeques, skillets, gas grills, stoves or ovens for **commercial applications** cook *FOOD*⁽¹⁾ placed flat or horizontally on the apparatus. *FOOD*⁽¹⁾ is cooked one side at a time, so while one side is cooking; the other side is drying up, affecting *FOOD*⁽¹⁾ taste. This conventional method of cooking requires human involvement in the cooking process, which cannot guarantee consistency in quality. *FOOD*⁽¹⁾ may be undercooked or overcooked. Overcooking affects taste, while undercooking may be potentially harmful. Also, there is no full-proof or guaranteed way to control consistency in quality of taste, because people who prepare the *FOOD*⁽¹⁾ may have different sets and/or levels of cooking qualifications, skills and experience. For commercial applications a single solution to all of the above problems is the elimination of any human involvement in the cooking process, which is accomplished by "**ROBOGRILL**" Automated Double-Motion Vertical Infrared Cooking Conveyor.

"**ROBOGRILL**" is an innovative invention, unlike any other device in its class, because it utilizes:

- A VERTICAL method of cooking *FOOD*⁽¹⁾
- Sprocket-shaped CARTRIDGES to hold *FOOD*⁽¹⁾ during the vertical cooking process.
- Infrared heat burners positioned on both sides of the conveyor along the traveling path of cartridges.

FOOD⁽¹⁾ – See Full Definition In Assumption

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- Two cooking stages - high heat temperature zone and low heat temperature zone as well as a cooling zone and cartridge discharge zone.
- A fully automated, double-motion, chain-driven conveyor, whereby the first motion moves the cartridges from the beginning to the end of the conveyor while the second motion continuously rotates the cartridges to prevent the *FOOD*⁽¹⁾ from burning or drying up during the cooking cycle.

By eliminating human involvement in the cooking process, **“ROBOGRILL”** achieves the following benefits over conventional methods of cooking *FOOD*⁽¹⁾:

Consistency In Taste

1. **“ROBOGRILL”** uses a vertical method of cooking that eliminates any human involvement in the cooking process.
2. **“ROBOGRILL”** guarantees consistency in quality of taste because *FOOD*⁽¹⁾ is neither overcooked nor undercooked and prepared with precision every time.

Speed Of Cooking Process And Health Benefits

3. **“ROBOGRILL”** utilizes infrared heat technology, enabling the **searing** of *FOOD*⁽¹⁾, which is not only much faster than conventional cooking methods, but also allows for the levels of fat and cholesterol in *FOOD*⁽¹⁾ to be minimized. The searing process seals juices in *FOOD*⁽¹⁾ by cooking with intense heat for a short period of time.
4. **“ROBOGRILL”** **does not require** for the operator to have any formal qualifications, skills or experience in the cooking process. This allows for better quality control and consistency in taste of *FOOD*⁽¹⁾ because it is the invention that is doing all the cooking, which eliminates the possibility of human error occurring in the cooking process.

FOOD⁽¹⁾ – See Full Definition In Assumption

In Summary, This Invention Accomplishes The Following Objectives:

- The ability to cook *FOOD*⁽¹⁾ both sides at the same time with the same controlled intensity of infrared heat
- The ability to cooks *FOOD*⁽¹⁾ faster that conventional cooking methods
- The ability to cook with infrared heat technology that enables searing of *FOOD*⁽¹⁾
- The ability to utilize a healthier method of cooking by minimizing the levels of fat and cholesterol in *FOOD*⁽¹⁾
- The ability to cook *FOOD*⁽¹⁾ without any human involvement in the cooking process
- The ability to guarantee consistency in quality and taste of *FOOD*⁽¹⁾ every time regardless of human qualifications, skills and/or previous cooking experience.

A5. Summary Of The Invention

“ROBOGRILL” is an Automated Double-Motion Vertical Infrared Cooking Conveyor designed for commercial applications. **“ROBOGRILL”** enables a better, faster and healthier process of cooking *FOOD*⁽¹⁾: Hamburgers, Steaks And The Like. *FOOD*⁽¹⁾ is not cooked flat (horizontally) as with conventional cooking methods, but sideways (vertically).

Infrared burners are placed along the conveyor line, projecting infrared heat to both sides of *FOOD*⁽¹⁾, at the same time and with the same controlled intensity of infrared heat to enable a searing process.

Searing Process

This invention utilizes infrared heat technology enabling a searing cooking process, which is significantly faster than conventional cooking methods. The searing cooking process seals juices in *FOOD*⁽¹⁾ by cooking with intense heat for a short period of time.

FOOD⁽¹⁾ – See Full Definition In Assumption

Cooking Process

FOOD⁽¹⁾ is inserted into multiple, sprocket-shaped cartridges made from food-grade type materials. These cartridges come in various sizes, each one specific for the type and size of *FOOD*⁽¹⁾ to be cooked. Cartridges loaded with *FOOD*⁽¹⁾ are placed on the automated, chain-driven cooking conveyor vertically, exposing both flat sides of *FOOD*⁽¹⁾ to infrared burners powered by natural gas, propane or electricity. Maximum capacity of conveyor is up to ten cartridges concurrently.

FOOD⁽¹⁾ in cartridges undergoes the cooking cycle through three temperature zones: high, low and cooling. Infrared heat is applied simultaneously to both sides of the *FOOD*⁽¹⁾ with controlled intensity. Cartridges move through conveyor vertically, while constantly rotating. Continuous rotation of cartridges allows cooking evenly, protecting *FOOD*⁽¹⁾ from burning or drying up. Speed of the conveyor, rotation of the cartridges and intensity of heat in each cooking zone are fully adjustable.

This apparatus cooks with about two to three times the intensity of average grills (1650⁰ Fahrenheit). Grease and *FOOD*⁽¹⁾ particles incinerate and are converted into flavorful vapors that cook back up into the *FOOD*⁽¹⁾. As a result, the content of fat and cholesterol in meat is minimized, producing not only better tasting but also healthier *FOOD*⁽¹⁾ than with conventional (horizontal/flat) method of cooking.

This apparatus does not require any human intervention during the cooking process. The only manual operation required is to insert *FOOD*⁽¹⁾ into cartridges, place the cartridges on and remove them from the cooking conveyor. This invention guarantees consistency in quality and taste every time, regardless of human qualifications, skills and/or previous cooking experience.

A6. Example Of Intended Use

COOKING OF HAMBURGERS

Step 1 Pre-formed, frozen hamburger patty is inserted into a sprocket-shaped cartridge. Cartridge is a universal holder for any size hamburger patty.

Step 2 Cartridge with hamburger patty is placed on the front of the conveyor.

(See Drawings – Figure 1, Point 1)

Step 3 The loaded cartridge with hamburger patty begins to move on conveyor path, while at the same time the cartridge itself continuously rotates throughout the cooking cycle.

Placing of cartridges on the conveyor is safe for the operator because this step is done prior to the cartridges entering the first high-temperature cooking zone.

The cartridge with the hamburger enters the high heat zone. Infrared heat is applied to both sides of the hamburger, at the same time and with the same controlled intensity. High heat zone begins the process of instantaneous searing of hamburgers. After, the cartridge moves through the lower heat zone. Next, the hamburger in the cartridge comes to the cooling zone. Finally the cartridge comes out of the conveyor in the cartridge discharge zone. *(See Drawings - Figure 4)*

Step 4 Cartridge with fully cooked hamburger is removed from the cartridge discharge zone. Cartridge is opened to remove the ready to eat hamburger and served to the customer.

Empty cartridge is ready for the next cooking cycle.

FOOD ⁽¹⁾ – See Full Definition In Assumption

A7. Brief Description Of The Drawings

In the drawings, which form a part of this specification,

- Figure 1** Goes together with the ABSTRACT and is a detailed top view and side view of the invention
- Figure 2** Is a detailed side view and top view of the sprocket-shaped cartridge
- Figure 3** Is a detailed side view of the chain attachments (cartridge holders)
- Figure 4** Is a detailed side view of cartridge discharge zone

A8. Detailed Description Of The Invention

With reference to drawings and, in particular, with reference to **Figure 1** (detailed side view and top view of the invention), the apparatus is comprised of a **MAIN HORIZONTAL OR LINEAR MOVING CONVEYOR AND A ROTATING CONVEYOR** with the following specifications:

1. Main horizontal (linear) moving conveyor utilizes # 50 double pitch chain with double attachments on 7.5" inches pitch.
2. Secondary rotating conveyor utilizes # 50 single roller chain.
3. Movement of both conveyors is accomplished through # 50 sprockets with 28 teeth.
4. Source of horizontal (linear) and rotating movements is accomplished through a motorized gearbox, which provides different speeds to both horizontal (linear) and rotating movements, which are fully adjustable.
5. Gear ratio between main horizontal (linear) and rotating conveyor is 4.66:1

FOOD ⁽¹⁾ – See Full Definition In Assumption

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6. Total cooking distance consists of the following:
 - High heat zone: 1 foot
 - Lower heat zone: 3 feet
 - Cooling zone: 1 foot
7. Conveyor speed is 4 feet of cooking distance in 3 minutes or 1.33 feet per minute.
8. Rotation of cartridges is approximately 3.8 revolutions per one foot of travel and is fully adjustable.
9. All sprockets at the end of the conveyor are spring loaded.

COOKING PROCESS

1. *FOOD*⁽¹⁾ is inserted into sprocket-shaped cartridges.
2. Cartridges with *FOOD*⁽¹⁾ are placed on chain attachments (cartridge holder).
3. Sprocket-shaped cartridges are engaged by a single roller chain, which continuously rotates the sprocket-shaped cartridges throughout the cooking cycle.
4. Sprocket-shaped cartridges with *FOOD*⁽¹⁾ undergo the cooking cycle from the beginning to the end of the conveyor. While constantly rotating with the speed described in section 1.8, cartridges with *FOOD*⁽¹⁾ undergo through high and low cooking zones. Next, the cartridges with *FOOD*⁽¹⁾ are moved to the cooling zone.
5. After the cooling zone, cartridges with ready-made *FOOD*⁽¹⁾ reach the cartridge discharge zone (**Figure 4**)
6. Cartridges are disengaged from the cartridge holders automatically and roll down to the cartridge discharge zone.
7. Cartridges are opened and the *FOOD*⁽¹⁾ is ready to be served.

FOOD⁽¹⁾ – See Full Definition In Assumption

3. DRAWINGS

The drawings attached with this document are as follows:

- Figure 1** Goes together with the ABSTRACT and is a detailed top view and side view of the invention
- Figure 2** Is a detailed side view and top view of the sprocket-shaped cartridge
- Figure 3** Is a detailed side view of the chain attachments (cartridge holders)
- Figure 4** Is a detailed side view of cartridge discharge zone

2.0 CLAIMS

THE EMBODIMENTS OF THE INVENTION IN WHICH AN EXCLUSIVE PROPERTY OR PRIVILEGE IS CLAIMED ARE DEFINED AS FOLLOWS:

1. **VERTICAL PROCESS OF COOKING**, whereby FOOD ⁽¹⁾ is not cooked flat (horizontally) as with conventional cooking methods, but sideways - vertically.
2. In conjunction with **VERTICAL PROCESS OF COOKING** as defined in **CLAIM 1**, **CARTRIDGES**, which hold the FOOD ⁽¹⁾ in vertical position during the vertical cooking process and having the following specifications:
 - Size of CARTRIDGES (inside diameter and width) varies in accordance with the type and size of the FOOD ⁽¹⁾ to be cooked.
 - CARTRIDGES containing FOOD ⁽¹⁾ are sprocket-shaped to allow their continuous rotation by one set of mechanical chains to cook FOOD ⁽¹⁾ evenly, while another set of mechanical chains pulls the CARTRIDGES along the conveyor through the cooking cycle.
 - CARTRIDGES allow infrared heat to penetrate and cook FOOD ⁽¹⁾ from both sides, at the same time with the same controlled intensity of infrared heat.
 - CARTRIDGES are made of food-grade type materials in accordance with all food and health regulations.
3. In conjunction with **VERTICAL PROCESS OF COOKING** as defined in **CLAIM 1** and **CARTRIDGES** as defined in **CLAIM 2**, **AN AUTOMATED DOUBLE-MOTION VERTICAL INFRARED COOKING CONVEYOR-TYPE APPARATUS FOR COMMERCIAL APPLICATIONS** with the following specifications:

FOOD ⁽¹⁾ – See Full Definition In Assumption

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- Main horizontal (linear) moving conveyor utilizes # 50 double pitch chain with double attachments on 7.5" inches pitch.
- Secondary rotating conveyor utilizes # 50 single roller chain.
- Movement of both conveyors is accomplished through # 50 sprockets with 28 teeth.
- Source of horizontal (linear) and rotating movements is accomplished through a motorized gearbox, which provides different speeds to both horizontal (linear) and rotating movements, both of which are fully adjustable.
- Gear ratio between main horizontal (linear) and rotating conveyor is 4.66:1
- Total cooking distance consists of the following:
 - High heat zone: 1 foot
 - Lower heat zone: 3 feet
 - Cooling zone: 1 foot
- Conveyor speed is 4 feet of cooking distance in 3 minutes or 1.33 feet per minute.
- Rotation of cartridges is approximately 3.8 revolutions per one foot of travel
- All sprockets at the end of the conveyor are spring loaded.
- Consisting of cartridge loading zone, high temperature cooking zone, low temperature cooking zone, cooling zone and a cartridge discharge zone.
- Intensity of heat from infrared burners powered by natural gas, propane or electricity in high and low temperature cooking zones are fully adjustable.

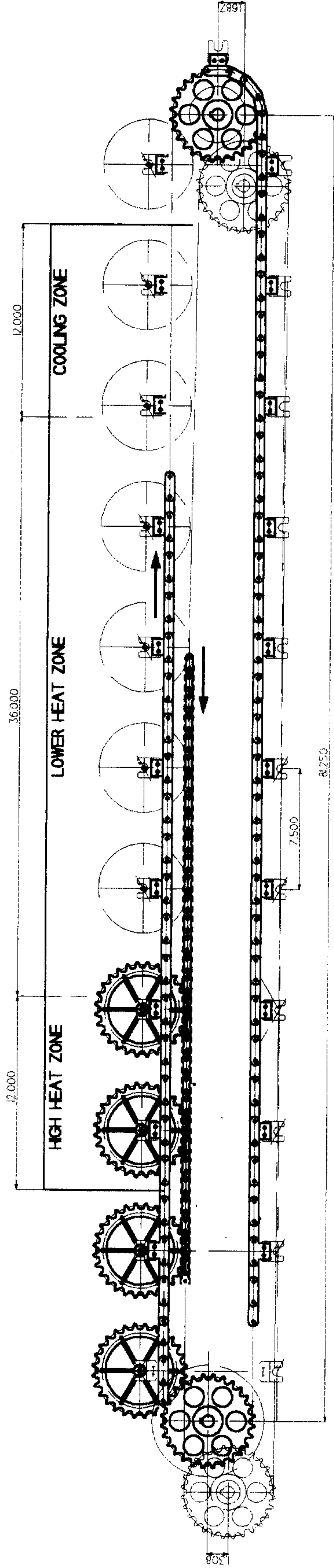
FOOD ⁽¹⁾ – See Full Definition In Assumption

CARTRIDGE - 3.8 REVOLUTIONS PER 1 FT. OF TRAVEL

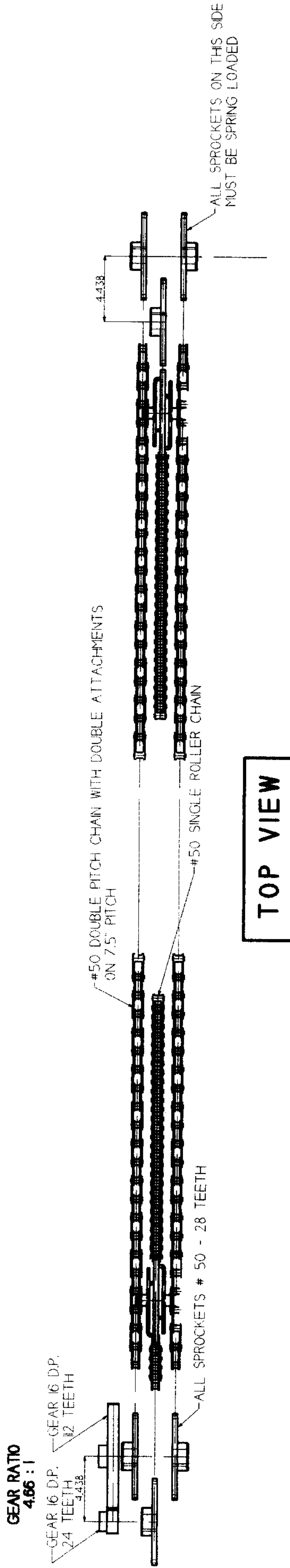
3 MIN COOKING TIME
 COOKING DISTANCE - 4 FT.
 CONVEYOR SPEED - 4 FT/3 MIN - 1.33 FPM
 HIGH HEAT - .75 MIN
 COLLING - .75 MIN

6 MIN. COOKING TIME
 COOKING DISTANCE - 4 FT.
 CONVEYOR SPEED - 4FT/6 MIN - .66 FPM
 HIGH HEAT - 1.5 MIN
 COOLING - 1.5 MIN

Figure 1 - ROBOGRILL Automated Double Motion Vertical Infrared Cooking Conveyor



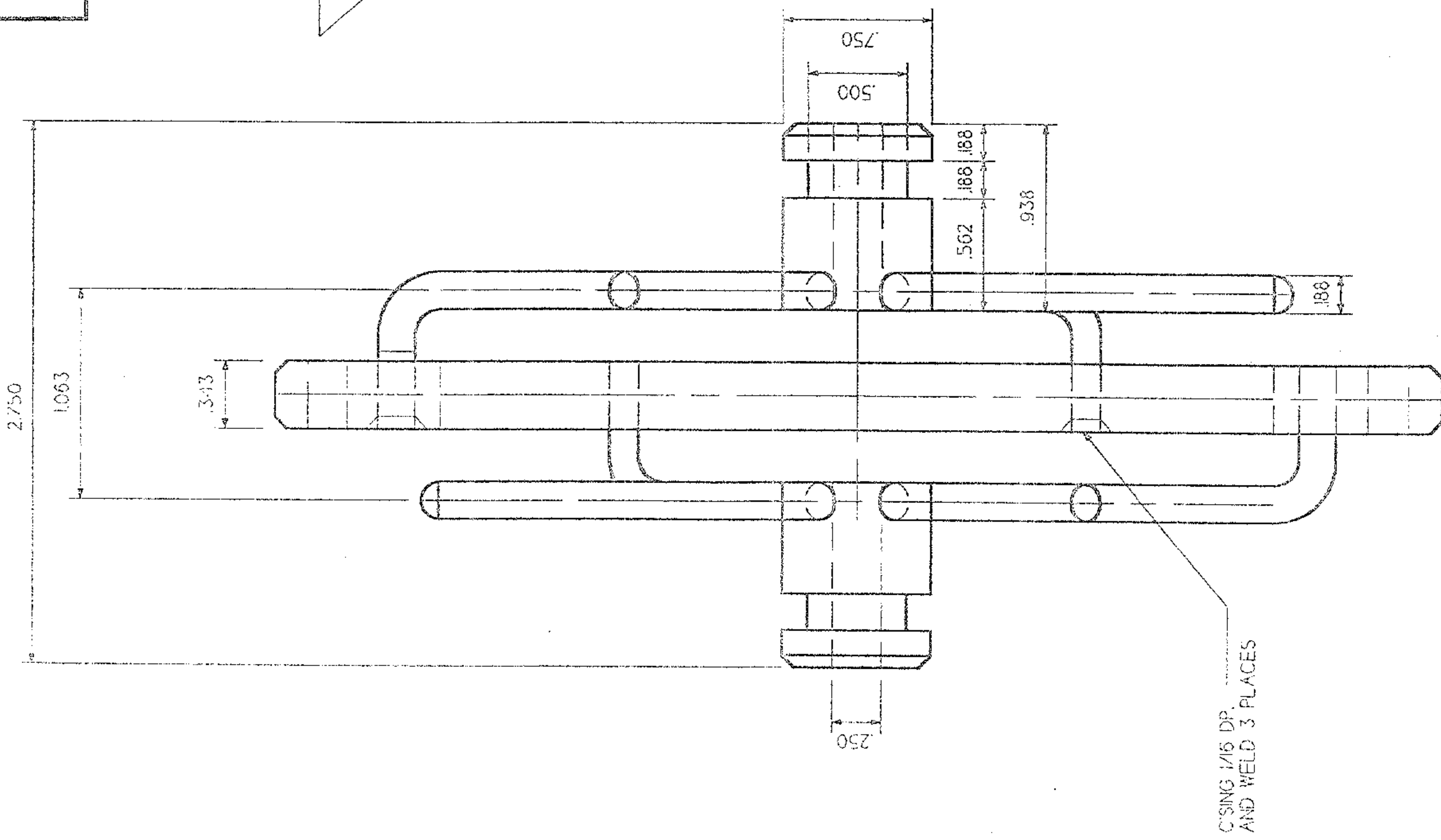
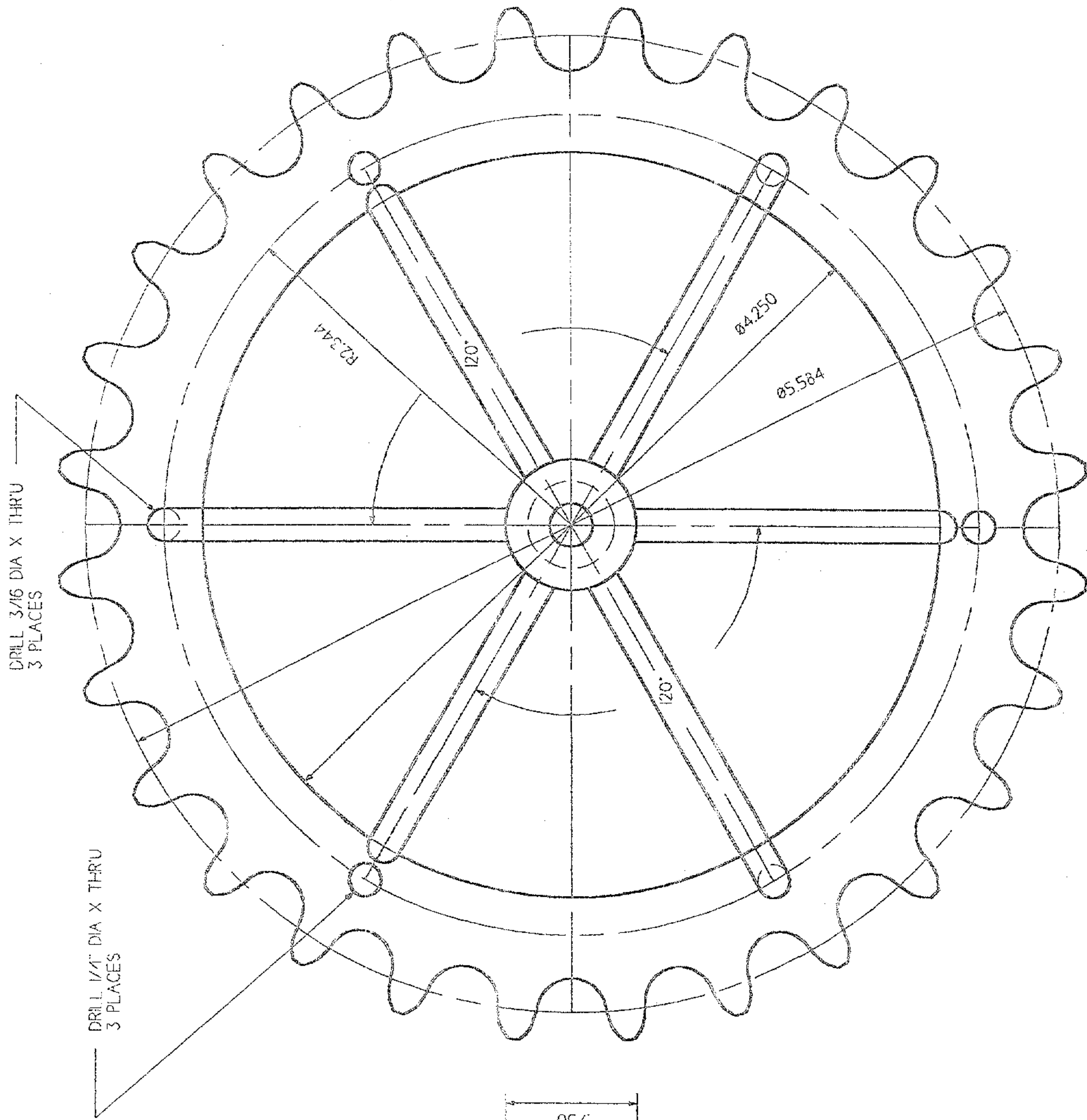
SIDE VIEW



TOP VIEW

Figure 2 - CARTRIDGE

SPROCKET 50A28
COAT CARTRIDGE WITH NEDOX



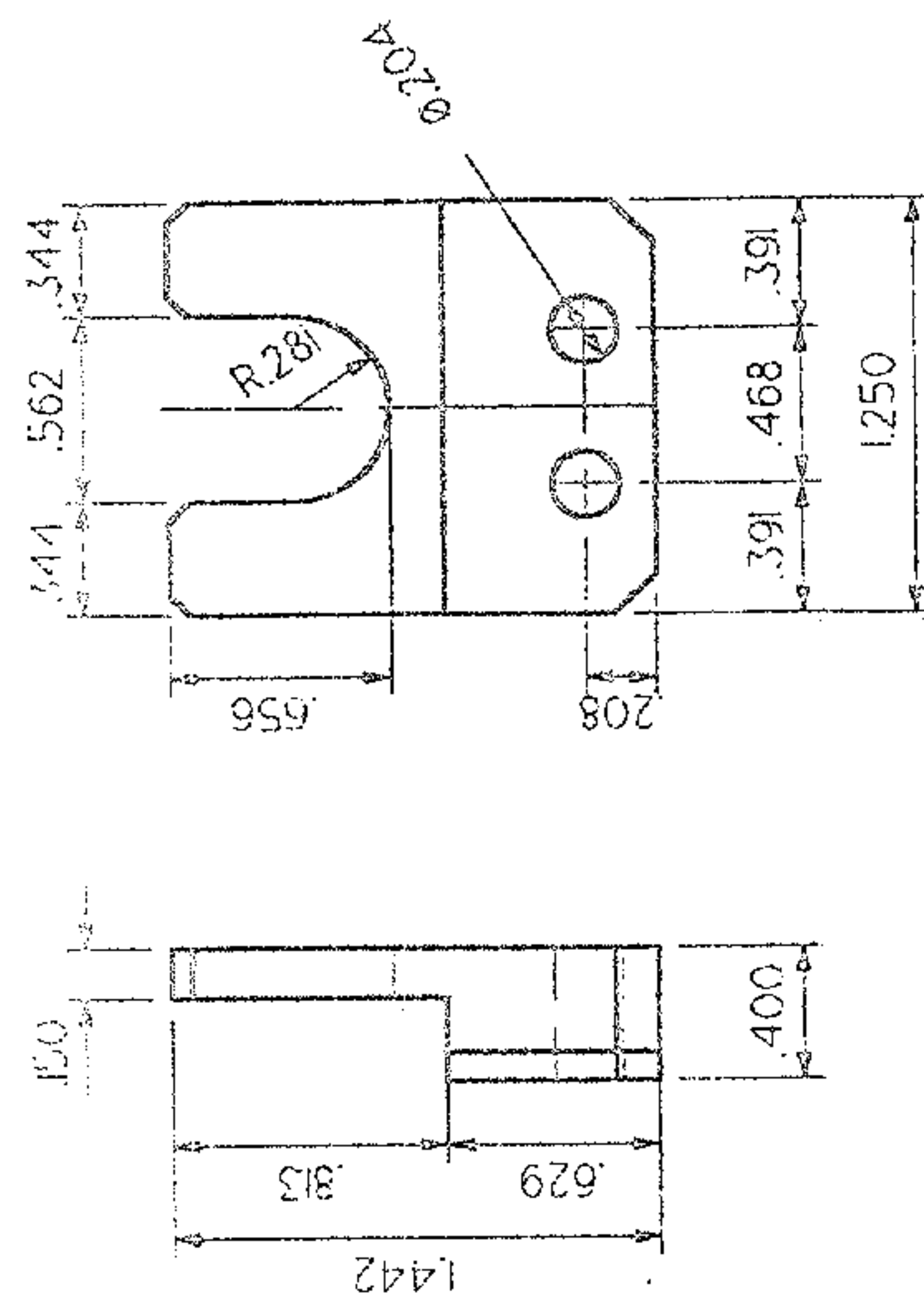


Figure 3 – CHAIN ATTACHMENTS

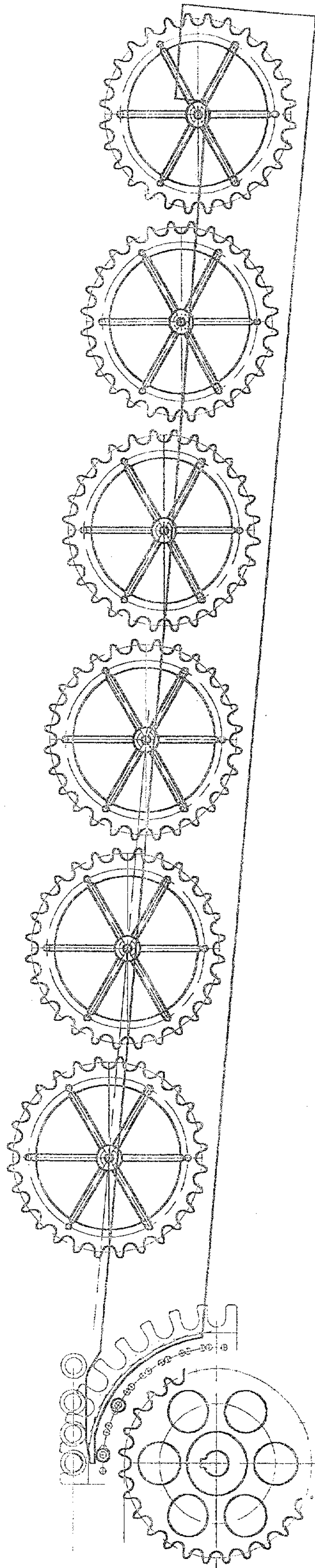


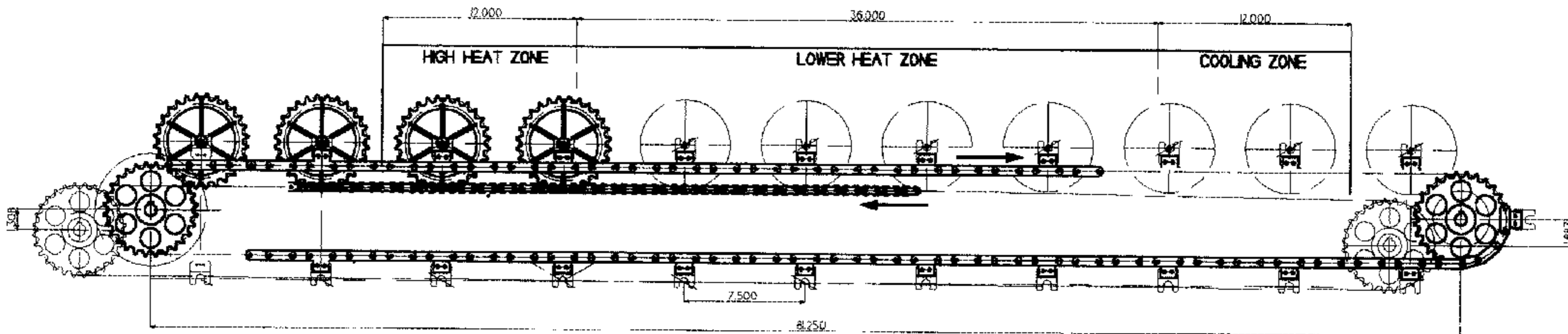
Figure 4 - CARTRIDGE DISCHARGE ZONE

6 MIN. COOKING TIME
 COOKING DISTANCE - 4 FT
 CONVEYOR SPEED - 4FT/6 MIN - .66 FPM
 HIGH HEAT - 1.5 MIN
 COOLING - 1.5 MIN

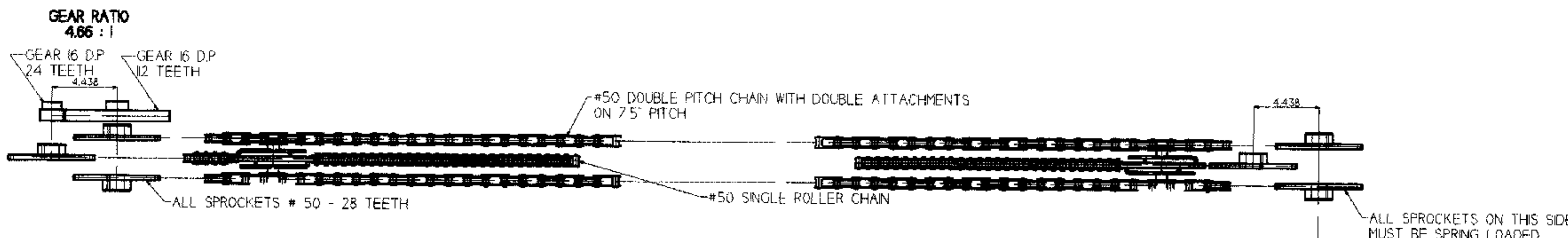
3 MIN COOKING TIME
 COOKING DISTANCE - 4 FT
 CONVEYOR SPEED - 4 FT/3 MIN - 1.33 FPM
 HIGH HEAT - .75 MIN
 COLLING - .75 MIN

CARTRIDGE - 3.8 REVOLUTIONS
 PER 1 FT. OF TRAVEL

- ROBOGRILL Automated Double Motion Vertical Infrared Cooking Conveyor



SIDE VIEW



TOP VIEW