

## ALPES INDUSTRIES SERVICES INTERNATIONAL PROFITEX Machinery plant



### Aseptic Pouch Filling Machine

**ADNV 39 P**

Machine presentation

ADNV 39P-2139 TO-IE



Aseptic Pouch Filling Machine ADNV 39P-2139 TO-IE is a vertical type automatic machine (molding-filling-sealing) designed for aseptic filling in bags (pouches). It folds the packaging film into a sleeve around the filler pipe, fills and seals the bags formed in this way, and then dumps them onto the bagging conveyor, which transports the bags for further packaging.

The model is a packaging machine with a programmable logic controller (PLC). The model has one filling head. Machine manufactured in the “U” version (for moderate climates), permission category 5 according to GOST 15150-69, operating temperature range from + 10 ° C to + 35 ° C and relative air humidity up to 85% at a temperature of + 25 ° C



### 3. SPECIFICATIONS

Name	Product Feature
Dosing method	volume
Dose adjustment, ml	100-1000
Time of continuous work, h / day	8
Power consumption kW	3.75
Rated voltage, V	380
Frequency of consumed current, Hz	50
Section of a copper wire of a power line, mm <sup>2</sup>	2,5
Supply voltage of control circuits and interlocks, V	24
Electrical protection class	IP56
Nominal working pressure, MPa, (kgf / cm <sup>2</sup> )	0.6
Compressed air consumption, l / min	400 <sup>1</sup>
Air supply	polypropylene, metal-plastic pipe with an inner diameter of at least 12 mm. Pipe fitting with outer diameter 16mm
Length mm	2635
Width mm	1150
Height mm	3300



## **2. DEVICE AND PRODUCT OPERATION**

01. The product consists of individual units, each of which performs special functions that provide packaging and the formation of a package of film.

02. The basic unit that determines the design of the product is - the machine body on which all the structural elements are located. (Ошибка! Источник ссылки не найден.)

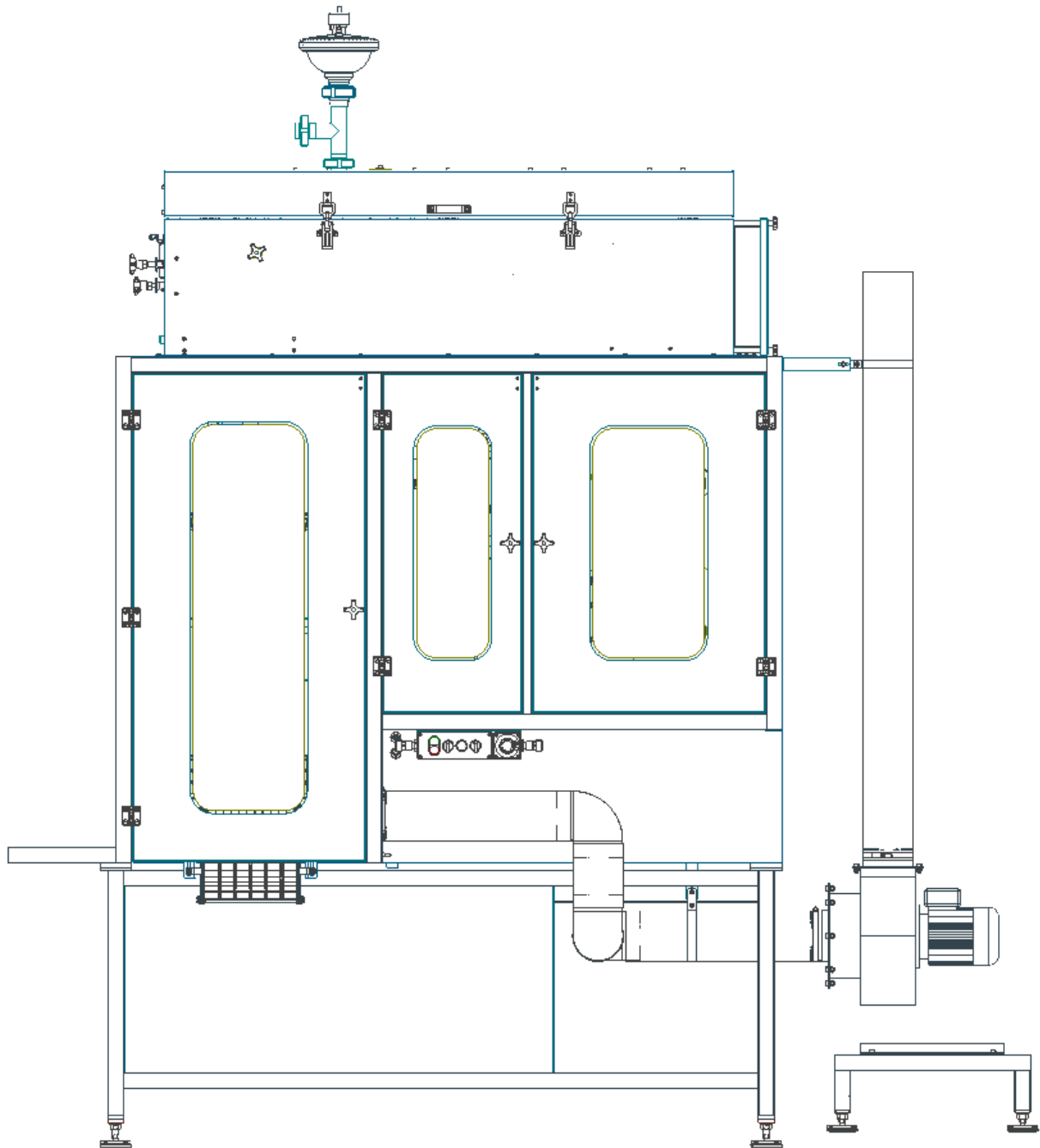
03. Basic equipment with units with which the product can be equipped:

- *Aseptic dispenser.*
- *Film unwinding unit.*
- *Aseptic film processing unit.*
- *Sleeve forming unit.*
- *Vertical sealing unit.*
- *Knot of a film broach.*
- *Horizontal sealing unit.*

04. The product performs the following technological operations:

- *Film is fed into the car.*
- *Produces aseptic processing of the film.*
- *Forms a sleeve.*
- *Stitches the sleeve vertically.*
- *Stretches a rolled film (sleeve).*
- *Doses the necessary portion of the product.*
- *Stitches the sleeve horizontally.*

**Pic. 1. Machine general view**





### **3. FUNCTIONAL SPECIFICATION**

The guidelines of the performance of the filling equipment of aseptic bags are described in this unit regarding two different aspects:

#### **3.1 The filling equipment of aseptic bags**

The standard equipment of the production line for filling aseptic bags includes the following facilities:

- Sterilizer
- Filling machine of aseptic bags
- Assembly unit for air sterilization
- Assembly lines for bags accepting

Film wrapper with the pull date of 15-30 days or five-layer film wrapper with the pull date of three months should be used as packaging material. The way how the weight and the amount of the production are changed depending on the size of the bag, is shown in the table specified below.

amount (mil)	weight (gram)	production (one item per 1 kg)
200	2.8	357
250	3	333
500	4.5	222
1000	7	143

#### **3.1. Sterilizer**

Ultra heat treatment (UHT) is used in the sterilizer to wipe out all microorganisms and to sterilize the product. The product becomes hot up to +140°C (284°F) during 3-4 seconds and then cools down up to +20°C (68°F) before it is delivered to the feed line that is directed to the filling machine with the pressure of 1,5-3 bars. Ultra heat treatment (UHT) is performing continually and the airtight system is used to avoid the product contamination.

More detailed information about the performance and the employment of the sterilizer is given in the manufacturer's manual. (See the manufacturer's manual)



### **3.2 The System of Pneumatic and Product Feed Pipelines**

The feed pipelines and the reverse lines of the pipeline system of the product connect the sterilizer and the filling machine. The junctions between the sterilizer and the filling machine comprises a whole group of valves and that allows to perform the following functions:

- The delivery of the product to the filling machine can be switched off with the help of the valve of the product.
- The flow along the peripheral passage is possible due to the overflow valve. The peripheral passage is necessary for supporting the constant positive pressure in the product delivery system.
- The pressure inside the pipeline system for the product delivery can be adjusted with the help of pressure adjustment valve.

The management of the valve operation is performed with the help of touch-sensitive screen of the filling machine.

Subject to the delivery contract all the necessary valves or definite valves with the sterilizer or with the filling machine must be included.

Respectively, airlines extending away from the ESA unit to the filling machine are included. The ESA unit provides the constant positive pressure of sterilized air to support aseptic conditions.



### **3.2 The phases of flow process**

#### **3.2. Presterilization**

Before the beginning of each phase of the flow process the sterilizer and the filling bag machine must be sterilized in the hot water of +140°C (284°F) circulating in the product delivery pipeline system. The temperature detector connected up to the timer provides the heating up all the pipelines to the temperature higher than +121°C (+250°F), at which, as it is well-known, all the microorganisms are sure to be wiped out if they are exposed to this temperature no more than 20 minutes from the time when the specified temperature is set in all the pipeline system.

After the completion of this process termed as presterilization all the surfaces that are in contact with the product are disinfected from both pathogenic bacteria and bacteria that lead to food spoilage. After sterilization the pipelines are cooled down with the help of sterilized water of +20°C (+68°F) circulating in the system.

Moreover, the pipelines connected with the air sterilization unit must be sterilized alongside with the product delivery pipeline system. During this process, also known as 'in-place steaming' (SIP), the live steam of +121°C (+250°F) is circulating throughout the duration of 20 minutes in the air filter system.

As the high temperature necessary for presterilization can be the cause of melting of polyethylene wrapping film around the hot filler pipe, the inner surface of the bubble must be covered with the heatproof polyethylene film during the sterilization process. After the completion of presterilization and SIP the presterilization film can be removed and the flow process can be initiated.

#### **3.2.2 Production**

After the completion of presterilization the cooling water going through the pipelines is changed to the product for filling. The ultra-heat treatment (UHT) is used for sterilizing the product in the sterilizer. The product is heating up to the temperature of +140°C (+284°F) during 3-4 seconds and then is cooling down up to the temperature of +20° C (+68°F) before it is delivered to the feed line that is directed to the filling machine with the pressure of 1,5-3 bars inside.

In order to avoid the penetration of unsterilized air inside the filling equipment, the filling machine must be connected to the air sterilization unit producing sterilized air that goes through the film unit, UV unit and linking unit.



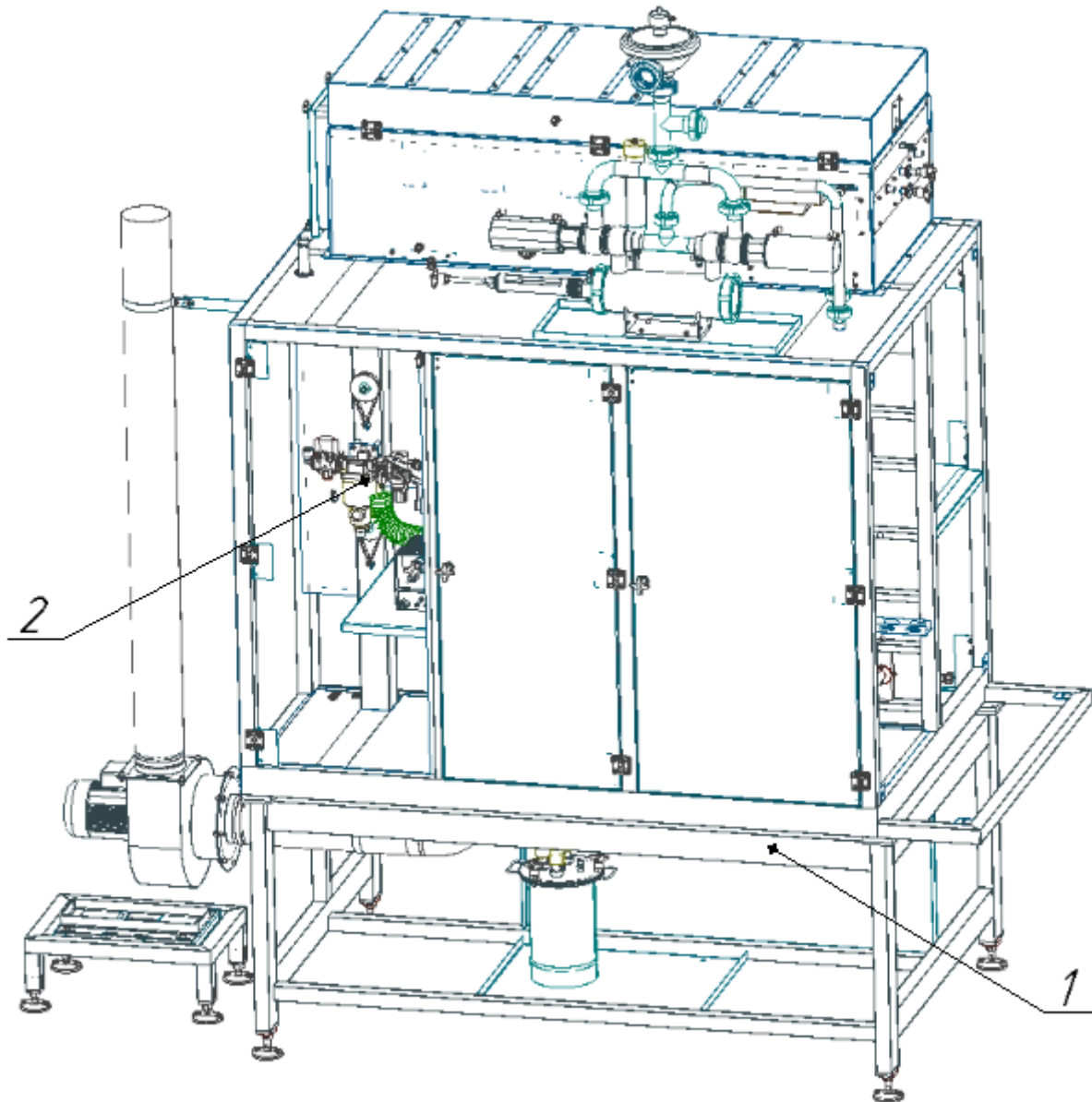


**3.2.3 Aseptic Intermediary Cleaning (AIC)**  
**3.2.4 In-place Cleaning (CIP)**

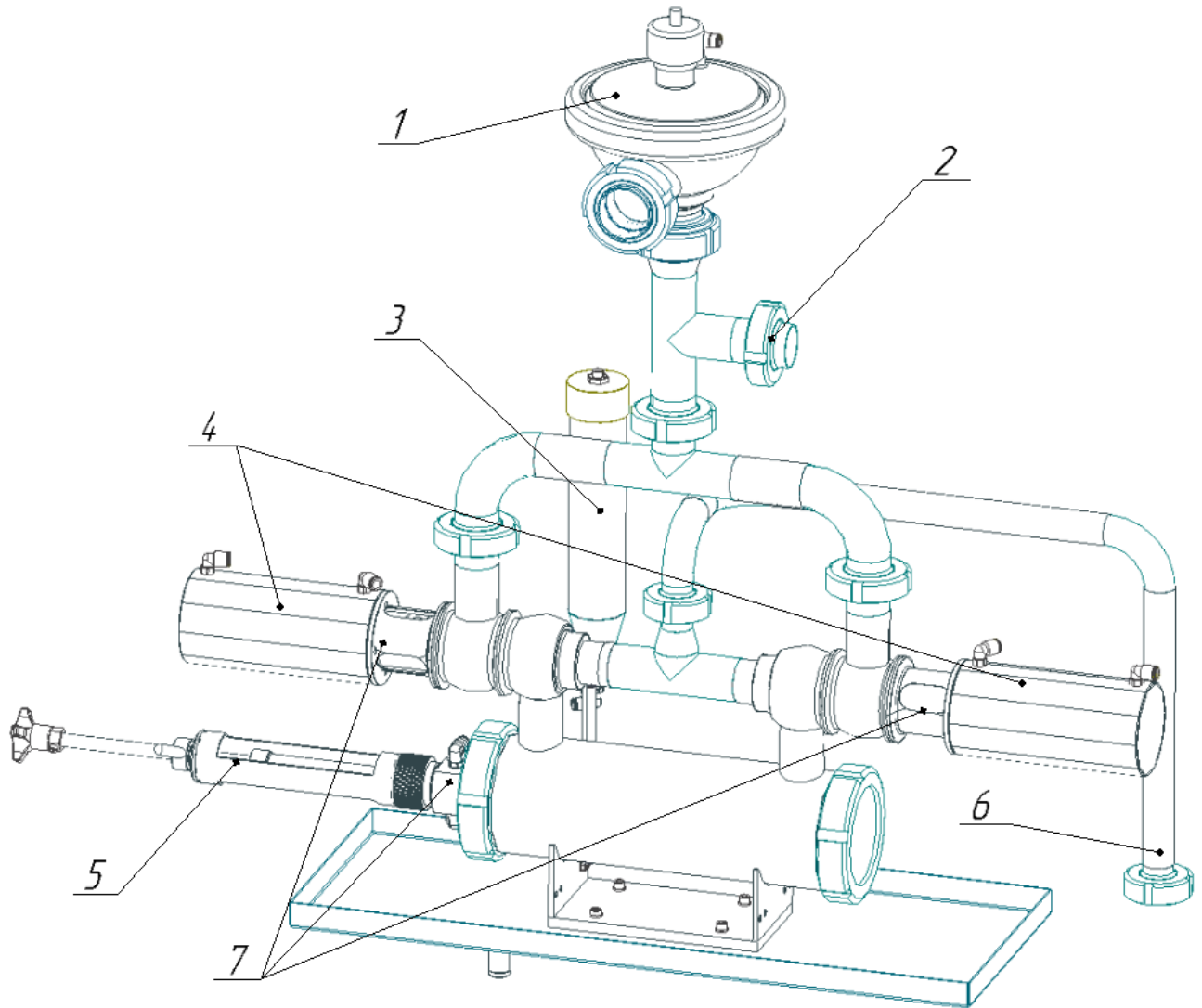
The final phase of the cleaning process that should be performed at least once during a working day after the completion of the flow process is called In-place Cleaning (CIP). During this process cleansing agents are circulating through all the product delivery pipeline system including the sterilizer, the filling machine and the filler pipe.

The recycle system is used in this equipment in which rinse liquid is getting ready in the tank of the sterilizer, then, it is carried into the pipeline system for cleaning. The rinse liquid will be circulating until the cleaning phase is completed. Then the final cleaning is performed. The cleaning of other surfaces of the machine should be carried out alongside with the CIP process, especially those that are located inside the linking unit.

**APPENDIX 1**

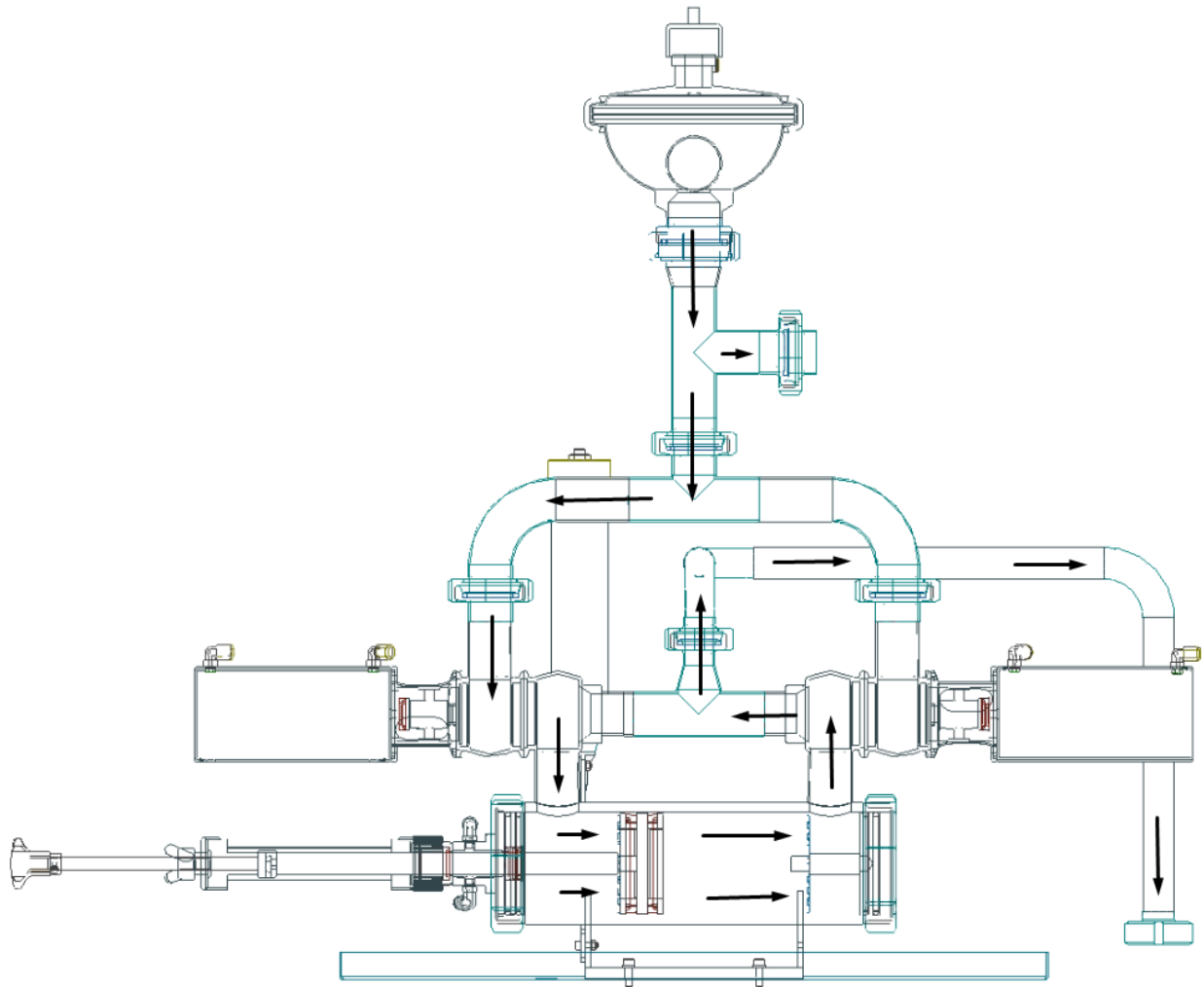


**Picture 1. Wireframe.**

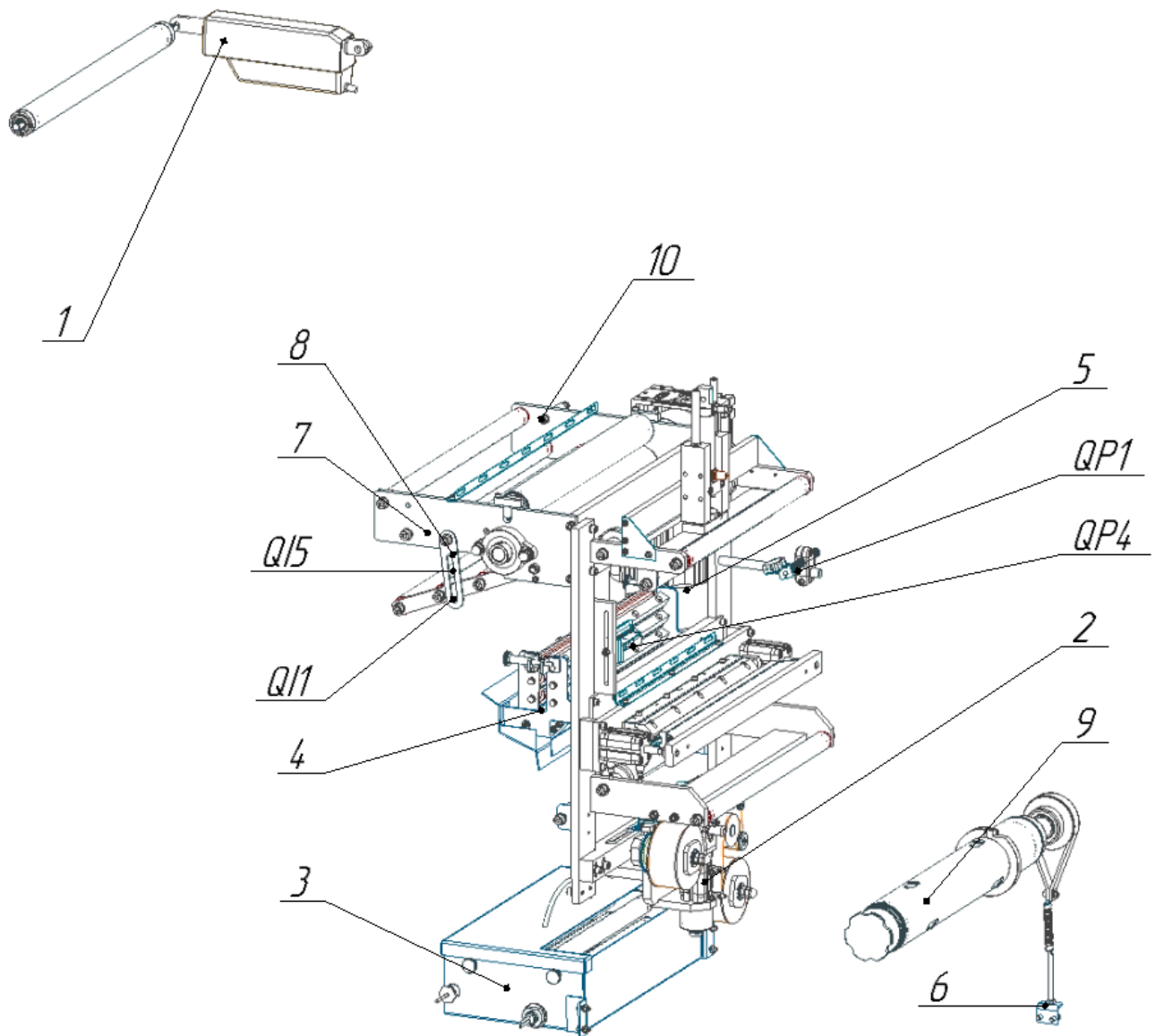


**Picture 2. Aseptic dispenser.**

1. Product Pressure Compensator
2. Bypass outlet pipe
3. Hydrogen peroxide flask with level sensor
4. Three way product feed valves
5. Dispenser stroke limiter (dose adjustment)
6. Bulk pipe
7. Hydrogen Peroxide Disinfection Chambers

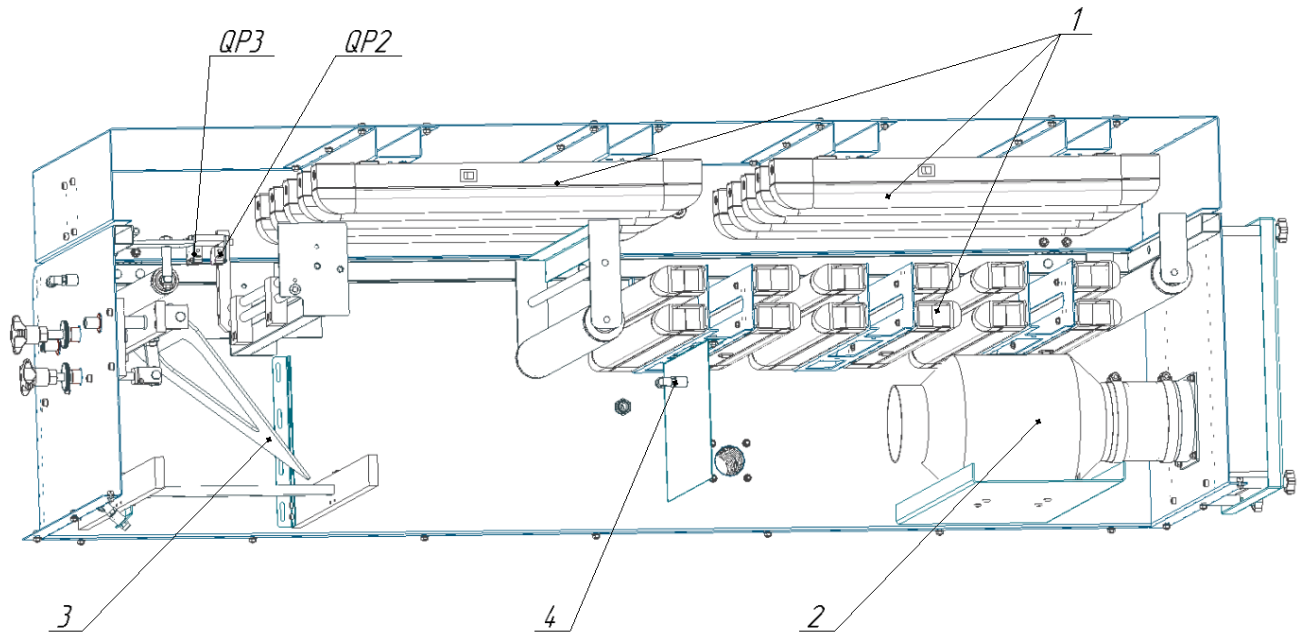


**Picture 3. Product flow chart.**



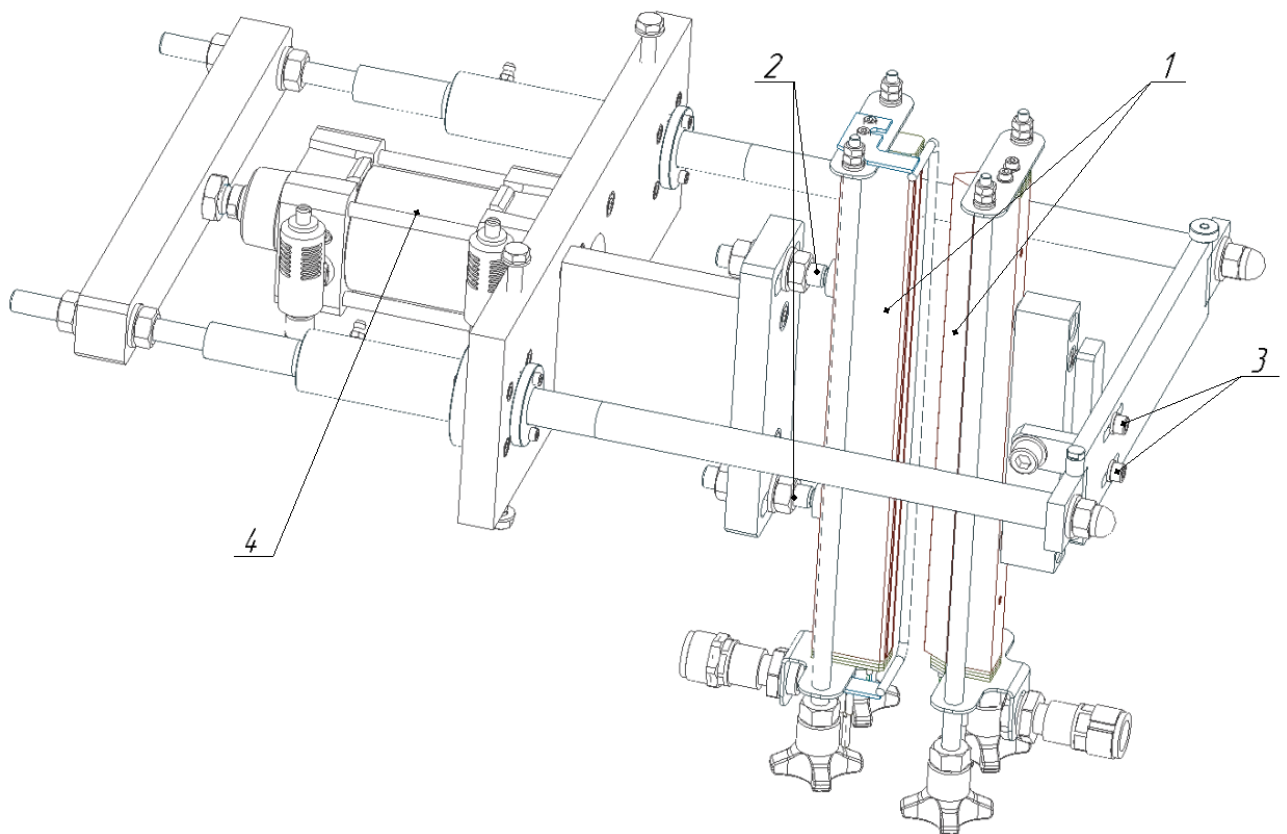
**Picture 4. Film feed unit.**

1. Linear film centering actuator
2. Thermal sensor
3. Peroxide container for film
4. Film peroxide removal unit
5. Film feed motor
6. Film feed roller tension unit
7. Film feed bypass system
8. Bar for QI1 and QI5 sensors
9. Film feed unit roller
10. Film feed assembly frame



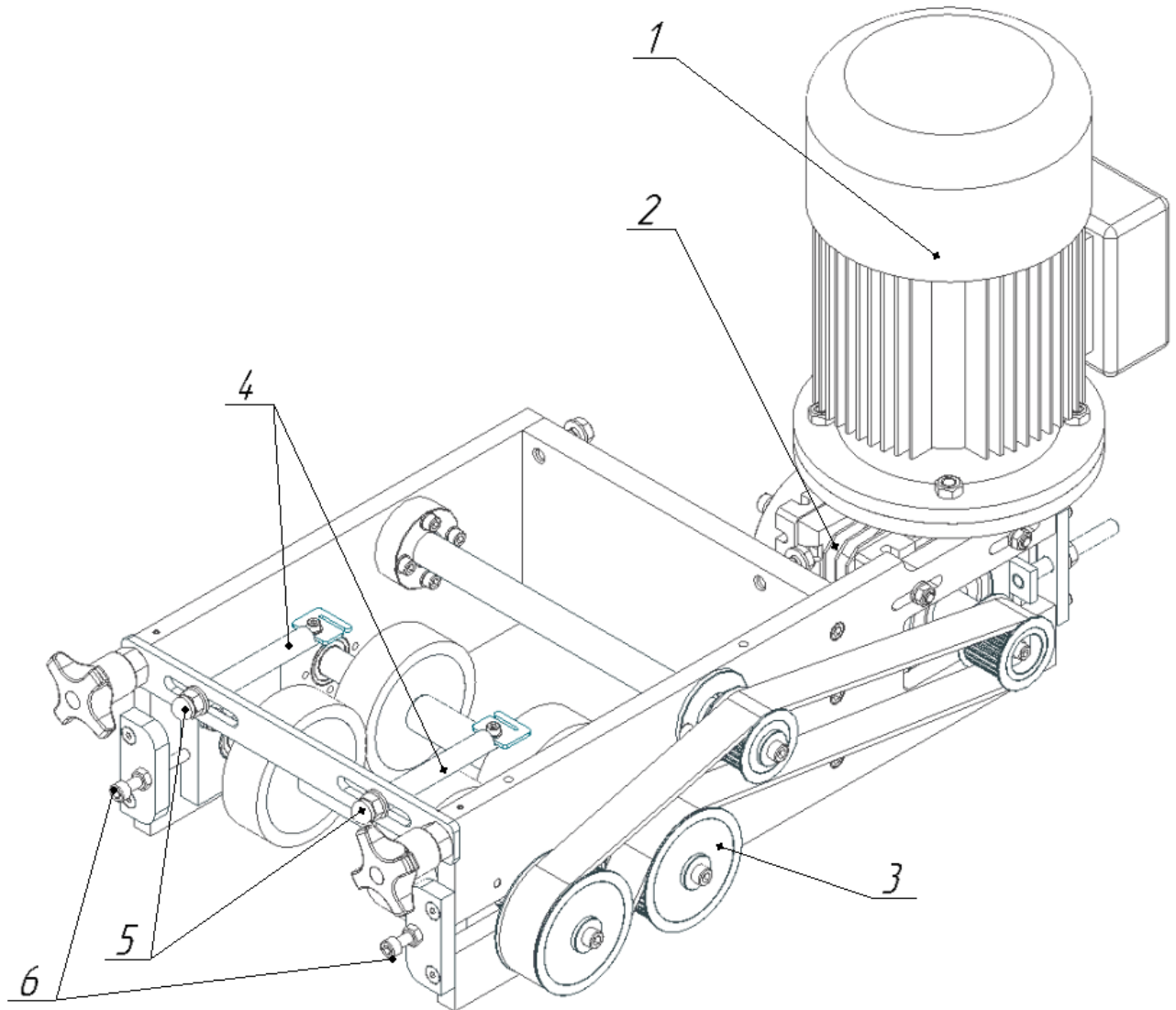
**Picture 5. UV processing unit and a collar for forming a sleeve from a film.**

1. UV lamp unit for film processing
2. Film blowing fan
3. Film sleeve collar
4. Peroxide Spray Nozzle



**Picture 6. Vertical sealing machine**

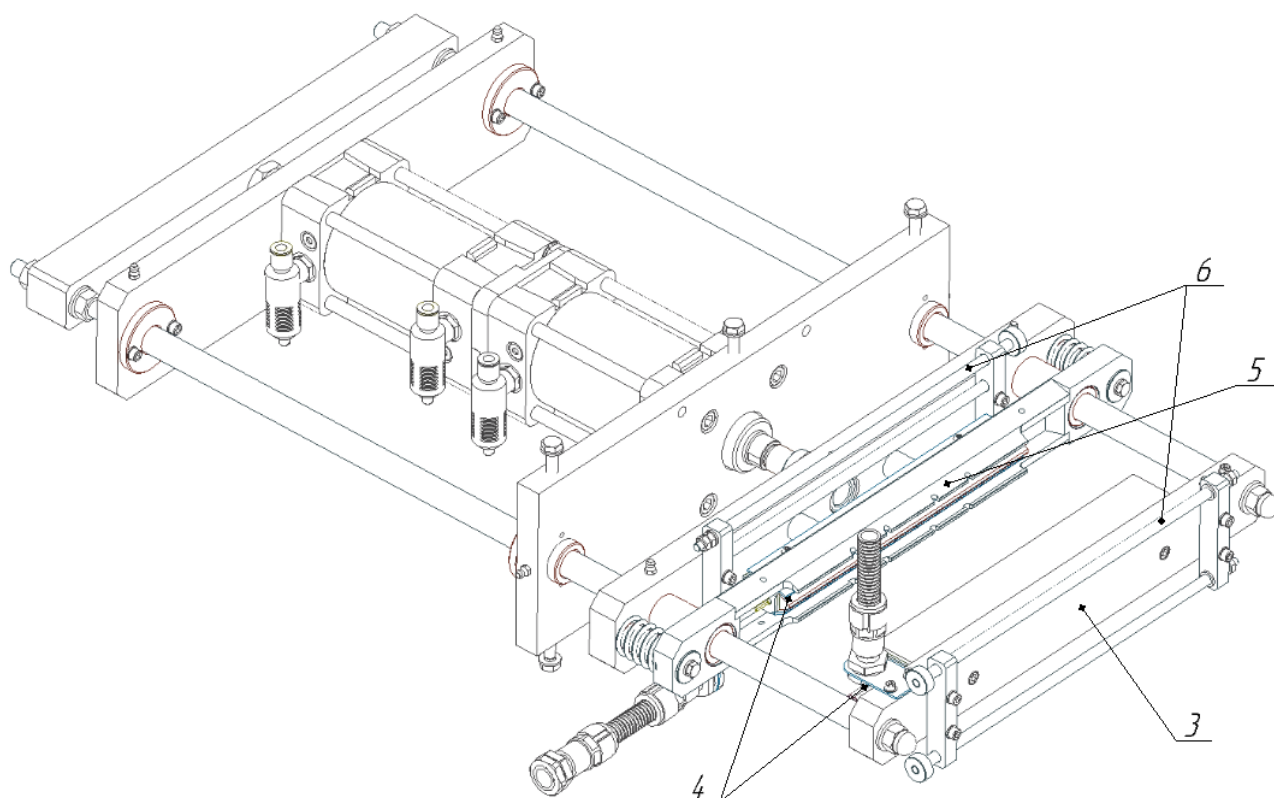
1. Horizontal sealing irons
2. Far Iron Adjustment Studs
3. Dowel adjusting screws
4. Pneumatic cylinder vertical film sealer



**Picture 7. Film Drawer Assembly**

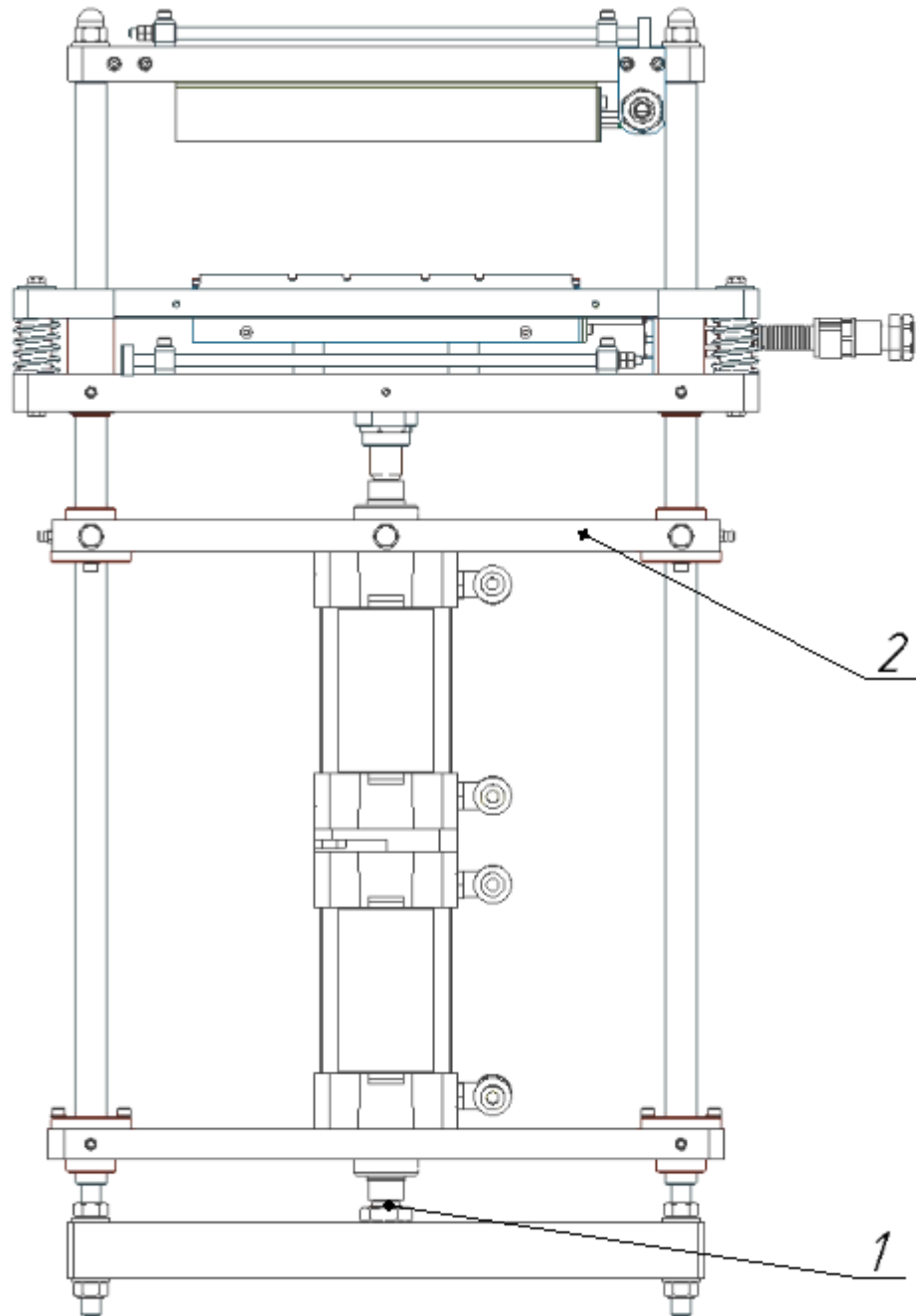
1. Film Drive Assembly Drive
2. Film Drive Assembly Drive Reducer
3. Pulleys of a film broaching unit
4. Film horizontal position limiters
5. Film Stop Positioning Nuts
6. Screws for adjusting the clamping force of the rollers of the film broaching unit





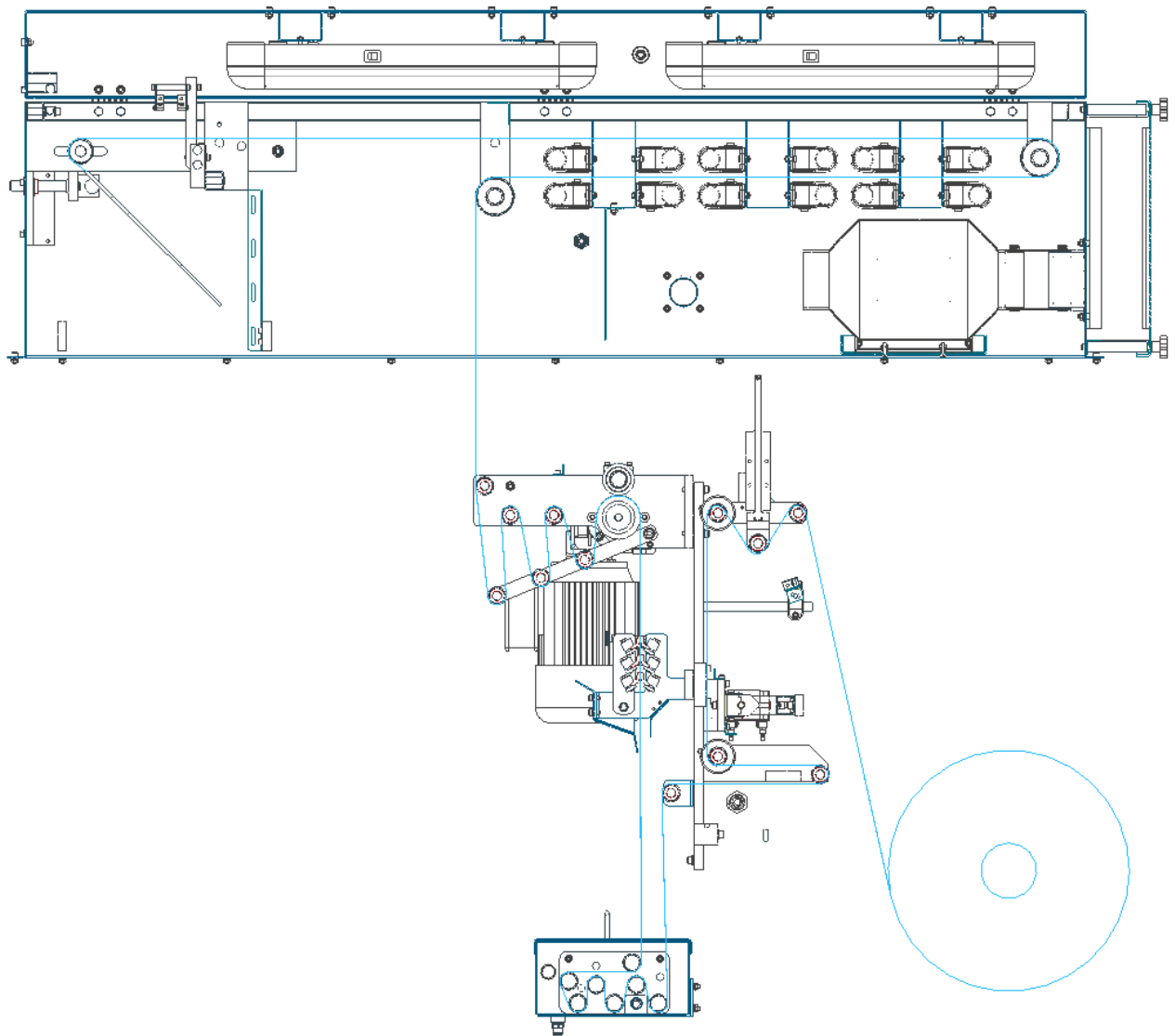
**Picture 8. Horizontal Sealing Unit**





**Picture 9. Horizontal sealing unit (top view)**

## APPENDIX 2



Film Refueling Scheme

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