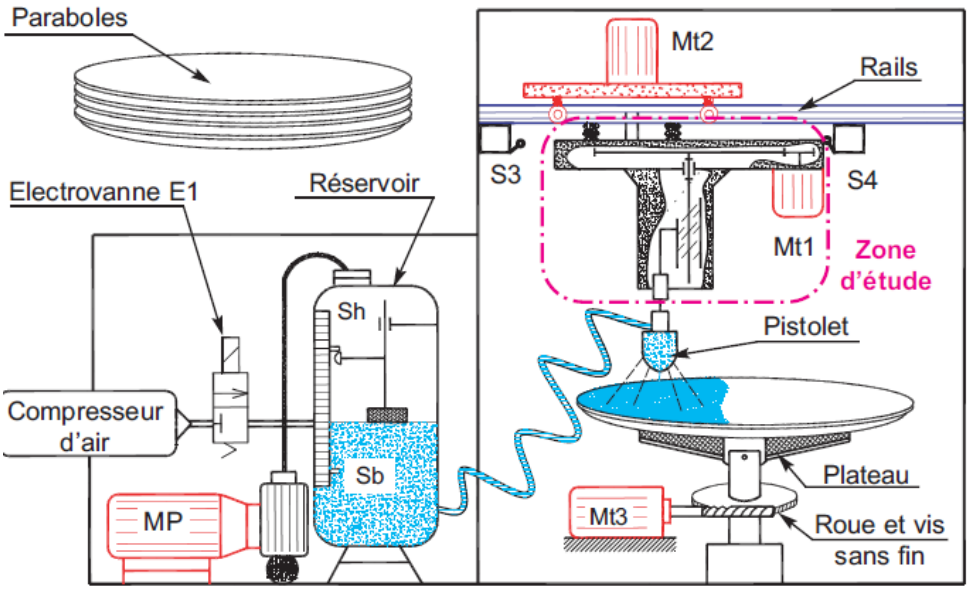
Tutorial 2: Making Connections

A. Assembly Dismountable

Study system : Automatic dish painting station

1- Presentation

The figure below represents the principle diagram of an automatic station. painting of parables. It allows two coats of paint to be applied to the face concave parabolas.



2- Description

The above system is made up of:

• A compressor driven by an electric motor Mt (not shown). He is triggered and interrupted automatically depending on the pressure in the tank. It is equipped with a pressure switch to limit the pressure between 6 and 8 bars.

• A tank containing the paint product (level fixed by two positions): Sb = 1 "minimum level" and Sh = 1 "full tank"

• An MP motor pump for filling the tank

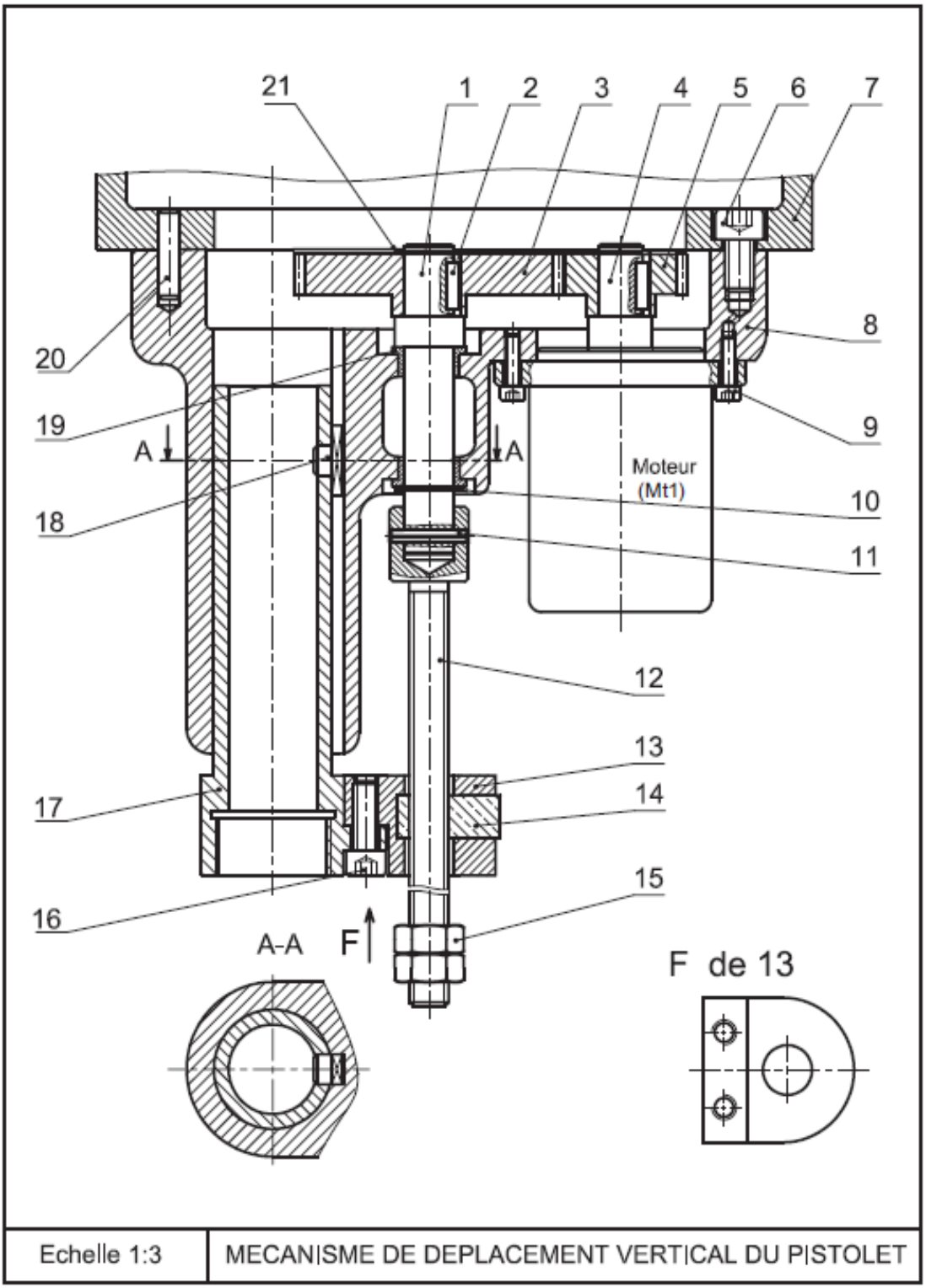
• An E 1 solenoid valve for controlling compressed air

• An Mt1 electric motor with two directions of rotation equipped with a speed reducer ensuring the vertical movement of the gun.

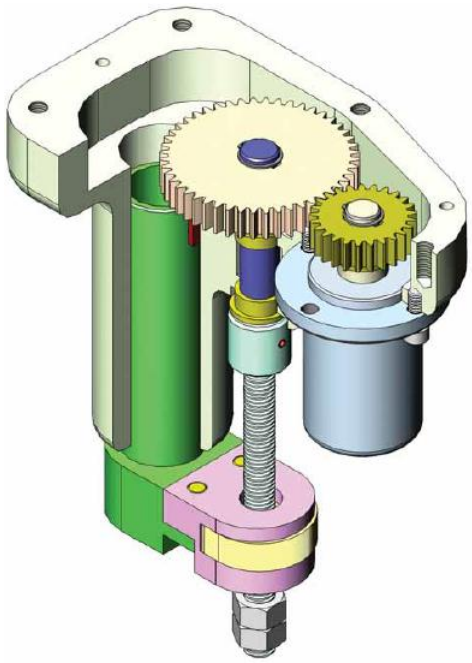
• An Mt2 electric motor with two directions of rotation ensuring horizontal movement of the gun.

• An Mt3 electric motor with adjustable speed ensuring the rotation of the plate, on which we place the parabolas. This motor is equipped with a wheel speed reducer and endless screw.

• The study will focus on the vertical movement mechanism of the gun.



20	2	Goupille de centrage ISO 8734 -8-30-A	C60	
19	2	Coussinet	CuSn8	
18	1	Clavette à ergot	C60	
17	1	Fourreau	C35	
16	2	Vis à tête cylindrique à 6 pans creux ISO 4762 M8-24		
15	2	Ecrou hexagonal ISO 4032 M14-08		
14	1	Ecrou spécial	CuSn8	
13	1	Chape	C35	
12	1	Vis d'entraînement	C35	
11	1	Goupille élastique ISO 8752	C60	
10	1	Anneau élastique pour arbre 18-1		
9	4	Vis à tête cylindrique à 6 pans creux ISO 4762 M 5-16		
8	1	Carter	EN GJL200	
7	1	Corps	EN GJL200	
6	6	Vis à tête cylindrique à 6 pans creux ISO 4762 M10-20		
5	1	Pignon	C35	
4	1	Arbre moteur	C35	
3	1	Roue dentée	C35	
2	1	Clavette parallèle, forme A 5x5x16	C35	
1	1	Arbre de sortie	C35	
Rep	**Nb**	**Désignation**	**Matière**	**Obs.**
MÉCANISME DE DÉPLACEMENT VERTICAL DU PISTOLET				



Vertical movement mechanism of the gun in 3D

Required work :

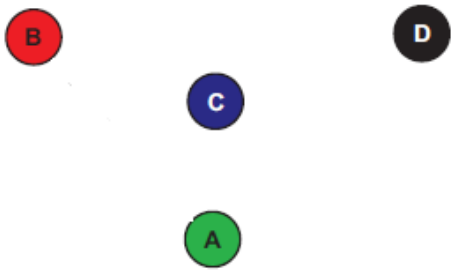
Referring to the overall drawing of the vertical movement mechanism of the gun:

a- Search for equivalence classes:

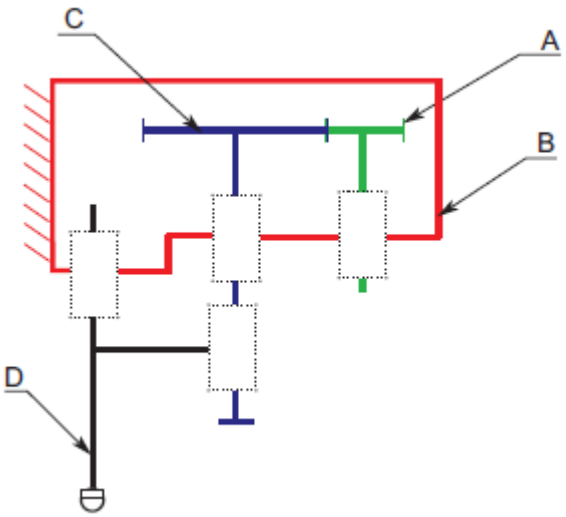
A = { 4; .....
B = { 8; .....
C = { 1; .....
D = {17; .....

b - Complete the graph of connections and designate the connections between the different equivalence classes:

L1: Connection .....
L2: Connection.....
L3: Connection .....
L4: Connection .....
L5: Connection .....



c - Complete the kinematic diagram:



d- Analysis of the assembly of the electric motor and the body (8):
Complete the following table:

Assembling the electric motor and the body (8)	**Betting surfaces in position**	**Position holding elements**

e- Modification of a solution:

The embedding connection of the drive screw (12) with the output shaft (1) is ensured by the elastic pin (11). In order to improve this connection we propose to interpose a rigid coupling.

We ask to complete the drawing of the solution proposed by:

- stopping the rotation of the shaft (1) and the drive screw (12) by two keys parallel, form A, 4x4x12
- the pinching of (1) and (12) by 4 cylindrical head screws with hexagon socket ISO 4762 M4-15