

EUROPEAN PATENT OFFICE
U.S. PATENT AND TRADEMARK OFFICE

CPC NOTICE OF CHANGES 1636

DATE: AUGUST 1, 2024

PROJECT MP11951

The following classification changes will be effected by this Notice of Changes:

Action	Subclass	Group(s)
SCHEME:		
Titles Changed:	H01J	37/023, 37/04, 37/06, 37/1413, 37/18, 37/20, 37/21, 37/22, 37/222, 37/224, 37/228, 37/241, 37/248, 37/266, 37/3007, 37/305, 37/3056, 37/31, 37/315, 37/3171
DEFINITIONS:		
Definitions New:	H01J	37/061, 37/224
Definitions Modified:	H01J	37/00, 37/023, 37/04, 37/1413, 37/20, 37/21, 37/22, 37/248, 37/26, 37/3002, 37/3007, 37/305, 37/31, 37/315, 37/317, 37/3171, 37/3174

No other subclasses/groups are impacted by this Notice of Changes.

This Notice of Changes includes the following [Check the ones included]:

1. CLASSIFICATION SCHEME CHANGES

- A. New, Modified or Deleted Group(s)
- B. New, Modified or Deleted Warning(s)
- C. New, Modified or Deleted Note(s)
- D. New, Modified or Deleted Guidance Heading(s)

2. DEFINITIONS

- A. New or Modified Definitions (Full definition template)
- B. Modified or Deleted Definitions (Definitions Quick Fix)

3. REVISION CONCORDANCE LIST (RCL)

4. CHANGES TO THE CPC-TO-IPC CONCORDANCE LIST (CICL)

5. CHANGES TO THE CROSS-REFERENCE LIST (CRL)

CPC NOTICE OF CHANGES 1636

DATE: AUGUST 1, 2024

PROJECT MP11951

1. CLASSIFICATION SCHEME CHANGES

A. New, Modified or Deleted Group(s)

SUBCLASS H01J - ELECTRIC DISCHARGE TUBES OR DISCHARGE LAMPS

<u>Type*</u>	<u>Symbol</u>	<u>Indent Level</u> <u>Number of</u> <u>dots (e.g.</u> <u>0, 1, 2)</u>	<u>Title</u> <u>“CPC only” text should normally be</u> <u>enclosed in {curly brackets}**</u>	<u>Transferred to#</u>
U	H01J37/02	1	Details	
M	H01J37/023	2	{Means for mechanically adjusting components not otherwise provided for}	
M	H01J37/04	2	Arrangements of electrodes and associated parts for generating or controlling the discharge, e.g. electron-optical arrangement or ion-optical arrangement {(H01J37/32009, H01J37/32623, H01J37/3266, H01J37/32697 take precedence; electron or ion-optical systems for localised treatment of objects H01J 37/3007)}	
M	H01J37/06	3	Electron sources; Electron guns	
M	H01J37/1413	6	{Means for interchanging parts of the lens, e. g. pole pieces within the tube}	
M	H01J37/18	2	Vacuum locks {; Means for obtaining or maintaining the desired pressure within the vessel}	
M	H01J37/20	2	Means for supporting or positioning the object or the material; Means for adjusting diaphragms or lenses associated with the support	
M	H01J37/21	2	Means for adjusting the focus	
M	H01J37/22	2	Optical {, image processing} or photographic arrangements associated with the tube	
M	H01J37/222	3	{Image processing arrangements associated with the tube}	
M	H01J37/224	3	{Luminescent screens or photographic plates for imaging; Apparatus specially adapted therefor, e. g. cameras, TV-cameras, photographic equipment or exposure control; Optical subsystems specially adapted therefor, e. g. microscopes for observing image on luminescent screen}	

CPC NOTICE OF CHANGES 1636

DATE: AUGUST 1, 2024

PROJECT MP11951

M	H01J37/228	4	{whereby illumination or light collection take place in the same area of the discharge}	
M	H01J37/241	3	{High voltage power supply or regulation circuits}	
M	H01J37/248	2	Components associated with high voltage supply	
M	H01J37/266	2	{Measurement of magnetic or electric fields in the object; Lorentzmicroscopy (spot analysing H01J37/252; emission microscopes H01J37/285; reflecting microscopes H01J37/29)}	
M	H01J37/3007	3	{Electron or ion-optical systems}	
M	H01J37/305	2	for casting, melting, evaporating, or etching	
M	H01J37/3056	4	{for microworking, e. g. etching of gratings or trimming of electrical components}	
M	H01J37/31	2	for cutting or drilling	
M	H01J37/315	2	for welding	
M	H01J37/3171	3	{for ion implantation}	
U	H01J37/3174	3	{Particle-beam lithography, e.g. electron beam lithography}	

*N = new entries where reclassification into entries is involved; C = entries with modified file scope where reclassification of documents from the entries is involved; Q = new entries which are firstly populated with documents via administrative transfers from deleted (D) entries. Afterwards, the transferred documents into the Q entry will either stay or be moved to more appropriate entries, as determined by intellectual reclassification; T = existing entries with enlarged file scope, which receive documents from C or D entries, e.g. when a limiting reference is removed from the entry title; M = entries with no change to the file scope (no reclassification); D = deleted entries; F = frozen entries will be deleted once reclassification of documents from the entries is completed; U = entries that are unchanged.

NOTES:

- **No {curly brackets} are used for titles in CPC only subclasses, e.g. C12Y, A23Y; 2000 series symbol titles of groups found at the end of schemes (orthogonal codes); or the Y section titles. The {curly brackets} are used for 2000 series symbol titles found interspersed throughout the main trunk schemes (breakdown codes).
- U groups: it is obligatory to display the required “anchor” symbol (U group), i.e. the entry immediately preceding a new group or an array of new groups to be created (in case new groups are not clearly subgroups of C-type groups). Always include the symbol, indent level and title of the U group in the table above.
- All entry types should be included in the scheme changes table above for better understanding of the overall scheme change picture. Symbol, indent level, and title are required for all types.
- “Transferred to” column must be completed for all C, D, F, and Q type entries. F groups will be deleted once reclassification is completed.
- When multiple symbols are included in the “Transferred to” column, avoid using ranges of symbols in order to be as precise as possible.
- For administrative transfer of documents, the following text should be used: “<administrative transfer to XX>”, “<administrative transfer to XX and YY simultaneously>”, or “<administrative transfer to XX, YY, ...and ZZ simultaneously>” when administrative transfer of the same documents is to more than one place.

CPC NOTICE OF CHANGES 1636

DATE: AUGUST 1, 2024

PROJECT MP11951

- Administrative transfer to main trunk groups is assumed to be the source allocation type, unless otherwise indicated.
- Administrative transfer to 2000/Y series groups is assumed to be “additional information”.
- If needed, instructions for allocation type should be indicated within the angle brackets using the abbreviations “ADD” or “INV”: <administrative transfer to XX ADD> , <administrative transfer to XX INV>, or <administrative transfer to XX ADD, YY INV, ... and ZZ ADD simultaneously>.
- In certain situations, the “D” entries of 2000-series or Y-series groups may not require a destination (“Transferred to”) symbol, however it is required to specify “<no transfer>” in the “Transferred to” column for such cases.
- For finalization projects, the deleted “F” symbols should have <no transfer> in the “Transferred to” column.

For more details about the types of scheme change, see CPC Guide.

DATE: AUGUST 1, 2024

PROJECT MP11951

2. A. DEFINITIONS (new)

H01J 37/061

References

Informative references

Attention is drawn to the following places, which may be of interest for search:

Secondary-emission tubes; Electron-multiplier tubes, in general	H01J 43/00
---	----------------------------

H01J 37/224

References

Informative references

Attention is drawn to the following places, which may be of interest for search:

Photosensitive materials	G03C 1/00
--------------------------	---------------------------

2. A. DEFINITIONS (modified)

H01J 37/00

Replace: The existing Definition statement text with the following updated text.

Definition statement

This place covers:

Discharge tubes or details thereof, in which a sample, workpiece or similar object can be placed and removed that is exposed to a discharge (in the following "tubes") to be e.g. analysed or processed (in the following "analysis tubes" or "treatment tubes", respectively).

Typical "discharge tubes" covered by this main group are:

- electron microscopes or ion microscopes,
- spot analysers (i.e. systems with relatively large (larger than about 50-100nm) beam spots for Auger or particle beam induced X-ray analysis),
- focused ion beam instruments,
- ion implanters,
- electron or ion lithography systems (i.e. for producing latent images for future processing steps in resists),
- systems for working materials with electron or ion beams (e.g. electron beam welding or cutting or drilling or machining, e-beam evaporation, etc.),
- systems for plasma-treatment (e.g. plasma etching or deposition systems).

The "discharge" is usually in the form of a dedicated, possibly guided and/or focused beam (in the following "beam tubes") of charged particles or in the form of a plasma (in the following "plasma tubes") not forming a beam.

Typical energies of the particles in the discharge (e.g. electrons or ions in a beam) are in general below a few hundred keV.

Nevertheless, this group also covers ion implanters and ultra high energy electron microscopes (both with energies of up to several MeV).

Further information:

General Structure of the scheme [H01J 37/00](#):

DATE: AUGUST 1, 2024

PROJECT MP11951

The scheme both for groups and Orthogonal indexing codes is organised according to the following principle:

- groups or details of the tube (sources, beam forming, sample holder etc.): [H01J 37/02 - H01J 37/248](#) and [H01J 2237/002 - H01J 2237/2487](#) ("details groups")
- analysing or imaging: [H01J 37/252 - H01J 37/2955](#) and [H01J 2237/25 - H01J 2237/2857](#).
- particle beam processing: [H01J 37/30 - H01J 37/3178](#) and [H01J 2237/30 - H01J 2237/31747](#).
- processing with gas-filled tubes (plasma tubes): [H01J 37/32 - H01J 37/36](#) and [H01J 2237/32 - H01J 2237/339](#).

References

Replace: The term "spectreters" with "spectrometers" in the reference below.

Limiting references

This place does not cover:

Particle spectrometer or separator tubes (in particular mass spectrometers)	H01J 49/00
---	----------------------------

Replace: The existing Informative references table with the following updated table.

Informative references

Attention is drawn to the following places, which may be of interest for search:

General purpose ion sources	H01J 27/00
Preservation of food or foodstuffs by corpuscular or ionising radiation	A23L 3/263
Methods or apparatus for disinfecting or sterilising materials other than foodstuffs or contact lenses by particle radiation	A61L 2/087
Sterilising wrappers or receptacles prior to, or during, packaging by irradiation	B65B 55/08

CPC NOTICE OF CHANGES 1636

DATE: AUGUST 1, 2024

PROJECT MP11951

Processes or apparatus specially adapted for the manufacture or treatment of microstructural devices or systems, e.g. MEMS	B81C
Coating by physical vapour deposition (PVD) such as vacuum evaporation, sputtering or ion implantation of the coating forming material	C23C 14/00
Chemical vapour deposition (CVD) processes	C23C 16/00
Processes for removing metallic material from surfaces	C23F 4/00
Measuring distances, level or bearings; Surveying	G01C
Preparation of specimen for investigation	G01N 1/00
Determining chemical or physical properties of materials by investigating or analysing by the use of wave or particle radiation	G01N 23/00
Investigating or analysing materials by the use of optical means, i.e. using sub-millimetre waves, infrared, visible or ultraviolet light	G01N 21/00
Scanning probe techniques	G01Q
Scanning tunneling microscopes	G01Q 60/10
Contactless testing of individual semiconductor devices using electron beams	G01R 31/2653
Contactless testing of electronic circuits using electron beams	G01R 31/305
Measurement of nuclear or x-radiation	G01T
Measuring X-radiation, gamma radiation, corpuscular radiation, or cosmic radiation	G01T 1/00
Light optics	G02B
Light optical microscopes	G02B 21/00
Lithography	G03F 1/00
Holographic processes or apparatus using particles	G03H 5/00
Sensing record carriers by corpuscular radiation	G06K 7/10
Protection against x-radiation, gamma radiation, corpuscular radiation or particle bombardment	G21F

CPC NOTICE OF CHANGES 1636

DATE: AUGUST 1, 2024

PROJECT MP11951

Techniques for handling particles or ionising radiation not otherwise provided for	G21K
Irradiation devices	G21K 5/00
Gamma- or X-ray microscopes wherein a (sub)-nanometre sized x-ray source is generated in an SEM-like apparatus by focusing an electron probe onto an x-ray transmissive target	G21K 7/00
Semiconductor devices	H01L
Manufacture of semiconductor devices by ion implantation	H01L 21/265
Modifying the pattern of conductors of semiconductor devices	H01L 21/76892
Testing of semiconductor devices during manufacture	H01L 22/00
Processes or apparatus for excitation, e.g. pumping, of lasers, by an electron beam	H01S 3/0959
Processes or apparatus for excitation of semiconductor lasers, e.g. pumping, e.g. by electron beams	H01S 5/04
Apparatus for generating ions to be introduced into non-enclosed gases, e.g. into the atmosphere	H01T 23/00
Preventing the formation of electrostatic charges in general	H05F 1/00
Generating plasma; Handling plasma	H05H 1/00
Arrangements for confining plasma by electric or magnetic fields for injection heating	H05H 1/22
Production or acceleration of neutral particle beams	H05H 3/00
Direct voltage accelerators; Accelerators using single pulses	H05H 5/00
Targets for producing nuclear reactions	H05H 6/00
Details of devices in linear accelerators and magnetic induction accelerators	H05H 7/00
Linear accelerators	H05H 9/00
Magnetic induction accelerators, e.g. betatrons	H05H 11/00
Magnetic resonance accelerators; Cyclotrons	H05H 13/00

DATE: AUGUST 1, 2024

PROJECT MP11951

Methods or devices for acceleration of charged particles not otherwise provided for	H05H 15/00
---	------------

Replace: The existing Special rules text with the following updated text.

Special rules of classification

Documents should usually be classified in all applicable categories:

If a document concerns embodiments or elements in detail which are covered by several subgroups dependent on a higher hierarchy group, the relevant information is classified in all the respective subgroups (example: a document concerning both ion sources and lenses is classified in [H01J 37/08](#) and in [H01J 37/10](#), not in the higher group [H01J 37/04](#)).

The higher hierarchy group is to be used:

If no respective subgroup exists;

If the general idea is relevant for the higher hierarchy as well as all the respective subgroups (example: a specific construction valid for all types of beam deflection is not classified in all the lower subgroups of [H01J 37/147](#) but in [H01J 37/147](#), but indexing codes under [H01J 2237/00](#) should be given for the (most important) embodiments).

If a document relates to a detail for which a group in [H01J 37/02](#) – [H01J 37/248](#) exists, this is classified there if none of the two following precedence rules applies:

- Generating/controlling the discharge is classified in [H01J 37/04](#) and subgroups, unless (entire) optical systems of treatment tubes are concerned, which are classified in [H01J 37/3007](#).
- Specific details for plasma tubes are usually considerably different from those of beam tubes and are classified in the subgroups of [H01J 37/32](#) – [H01J 37/32183](#) if they are not of general interest for [H01J 37/00](#), e.g. if relevant for different types of tubes.

If the classified detail is specific for a certain type or for certain types of tubes, then this tube type(s) should be classified with the appropriate symbol in either [H01J 37/00](#) or [H01J 2237/00](#), depending on the specificity.

For example:

DATE: AUGUST 1, 2024

PROJECT MP11951

A document discloses and claims a particular construction of an objective lens specifically in a scanning electron microscope and generally states that this lens could be employed also for all other types of charged particle beam instruments like transmission electron microscopes, focused ion beam systems and ion implanters. The document is classified in the appropriate subgroup in [H01J 37/10](#) (lens) and in [H01J 37/28](#) (SEM). It is, however, not classified in view of TEM, FIB or ion implanters because lenses for these systems are usually considerably different.

Invention information is classified in the respective symbol under [H01J 37/00](#); Orthogonal indexing codes under [H01J 2237/00](#) are to be given where they provide additional aspects or provide for a more detailed subdivision.

For example:

A document concerns details of the construction of a gas field ion source specifically in a FIB-microworking device. This document is classified in [H01J 37/08](#) (ion sources) and [H01J 37/3056](#) (microworking). It is further classified in [H01J 2237/061](#) (construction of source) and [H01J 2237/0807](#) (gas field ion source).

Additional (non-invention information) is classified with symbol under [H01J 37/00](#) and/or Orthogonal indexing codes, if it is relevant for search: If a certain (non-claimed) feature is described in particular detail, it should be classified similar to invention information. If a combination of features is described which goes beyond what is implicit to a certain device or only minor but still search-relevant information is given on the particular feature, said features should be classified with respective Orthogonal indexing code(s).

For example:

For the claimed construction of the gas field ion source in the FIB-system of the above example, in addition, also a known construction of a very fast beam blanker is described in detail which works particularly well with the inventive source. Then the symbol for the beam blanker [H01J 37/045](#) and the Orthogonal indexing code [H01J 2237/0432](#) (high speed beam blanking) should be given in addition.

Rules for classification regarding [H01J](#) for general elements:

As it is the case in [H01J](#) in general, for elements of general type which may be found in other types of discharge tubes, a group corresponding to general schemes [H01J 1/00](#) – [H01J 7/00](#) is given, e.g. for cathodes, vessels, cooling means or the like. Same rules apply for manufacturing procedures ([H01J 9/00](#)), unless specific to the tube concerned (as however elements for the tubes covered by [H01J 37/00](#) are usually very specific, this seldom applies).

DATE: AUGUST 1, 2024

PROJECT MP11951

Delete: The following row from the Synonyms and Keywords table.

Synonyms and Keywords

In patent documents the following abbreviations are often used:

REM	Rasterelektroncnmikroskop (German acronym for "SEM")
-----	--

H01J 37/023

References

Delete: The entire Limiting references section.

Replace: The existing Informative references table with the following updated table.

Informative references

Attention is drawn to the following places, which may be of interest for search:

Mutual adjustment of electrodes in electron guns	H01J 37/067
Mechanically adjusting from the outside of electron or ion-optical components	H01J 37/15
Vacuum locks, means for obtaining or maintaining the desired pressure within the tube	H01J 37/18
Positioning the object or material	H01J 37/20
Manufacture or treatment of parts of semiconductor devices prior to assembly	H01L 21/48
Structural combination with remotely-controlled apparatus, e.g. with manipulators	G21F 7/06

DATE: AUGUST 1, 2024

PROJECT MP11951

H01J 37/04

Replace: The existing Definition statement text with the following updated text.

Definition statement

This place covers:

Ion-optical systems only of tubes of the types in [H01J 37/252](#) – [H01J 37/2955](#) (analysis/beam tubes) or details for which no specific subgroup is provided.

References

Replace: The existing Limiting references table with the following updated table.

Limiting references

This place does not cover:

Electron or ion-optical systems for localised treatment of objects	H01J 37/3007
Discharge control means in gas filled discharge tubes	H01J 37/32009
Mechanical discharge control means	H01J 37/32623
Magnetic control means	H01J 37/3266
Electrostatic control	H01J 37/32697

H01J 37/1413

References

Delete: The entire Limiting references section.

Insert: The following new Informative references section.

DATE: AUGUST 1, 2024

PROJECT MP11951

Informative references

Attention is drawn to the following places, which may be of interest for search:

Mechanically adjusting electron (ion) optical components	H01J 37/15
--	----------------------------

H01J 37/20

References

Delete: The entire Limiting references section.

Insert: The following two new references in the Informative references table.

Informative references

Attention is drawn to the following places, which may be of interest for search:

Irradiation devices with provision for relative movement of beam source and object to be irradiated	G21K 5/10
Vacuum locks	H01J 37/18

Insert: The following new Relationships section.

Relationships with other classification places

Means for supporting or positioning during introduction or outputting an object are classified in H01J37/18.

DATE: AUGUST 1, 2024

PROJECT MP11951

H01J 37/21

References

Delete: The entire Limiting references section.

Insert: The following new reference in the Informative references table.

Informative references

Attention is drawn to the following places, which may be of interest for search:

Adjusting the focus while observing the image by photographic or optical means	H01J37/22
--	---------------------------

H01J 37/22

Replace: The existing Glossary of terms text with the following updated text and table.

Glossary of terms

In this place, the following terms or expressions are used with the meaning indicated:

optical	relates to light-optical
---------	--------------------------

H01J 37/248

References

Delete: The entire Limiting references section.

Insert: The following new Informative references section.

DATE: AUGUST 1, 2024

PROJECT MP11951

Informative references

Attention is drawn to the following places, which may be of interest for search:

Means for measuring the high voltage per se	G01R 15/00
---	------------

H01J 37/26

Insert: A period at the end of the Definition statement.

Definition statement

This place covers:

Transmission electron microscopes.

References

Delete: The entire Limiting references section.

Replace: The existing Special rules text with the following updated text.

Special rules of classification

Scanning electron microscopes are covered by [H01J 37/28](#), also scanning transmission microscopes are covered by [H01J 37/28](#) with Orthogonal indexing code [H01J 2237/2802](#).

DATE: AUGUST 1, 2024

PROJECT MP11951

H01J 37/3002

Replace: The existing Definition statement text with the following updated text.

Definition statement

This place covers:

Details specific to beam treatment tubes for localised treatment of objects.

H01J 37/3007

References

Delete: The entire Limiting references section.

H01J 37/305

References

Delete: The entire Limiting references section.

Insert: The following new Informative references section.

Informative references

Attention is drawn to the following places, which may be of interest for search:

Methods for casting or melting of metals with electron beam or gas discharges	C22B 9/22
Processes for removing metallic materials from surfaces, e.g. by evaporation using e-beams	C23F 4/00

DATE: AUGUST 1, 2024

PROJECT MP11951

H01J 37/31

References

Delete: The entire Limiting references section.

Insert: The following new Informative references section.

Informative references

Attention is drawn to the following places, which may be of interest for search:

Methods for cutting or drilling metals with electron beams	B23K 15/00
--	----------------------------

H01J 37/315

References

Delete: The entire Limiting references section.

Insert: The following new Informative references section.

Informative references

Attention is drawn to the following places, which may be of interest for search:

Methods for welding metals with electron beams	B23K 15/00
--	----------------------------

H01J 37/317

References

Insert: The following new Informative references section.

DATE: AUGUST 1, 2024

PROJECT MP11951

Informative references

Attention is drawn to the following places, which may be of interest for search:

Coating by vacuum evaporation, by sputtering or by ion implantation of the coating forming material	C23C 14/00
---	----------------------------

H01J 37/3171

References

Delete: The entire Limiting references section.

Insert: The following new Informative references section.

Informative references

Attention is drawn to the following places, which may be of interest for search:

Plasma immersion ion implantation	H01J 37/32412
-----------------------------------	-------------------------------

H01J 37/3174

References

Delete: The entire Limiting references section.

Replace: The existing Informative reference table with the following updated table.

Informative references

Attention is drawn to the following places, which may be of interest for search:

Electron or ion microscopes	H01J 37/26
-----------------------------	----------------------------

CPC NOTICE OF CHANGES 1636

DATE: AUGUST 1, 2024

PROJECT MP11951

Stereolithography, i.e. manufacturing of 3D objects	B29C 64/00
Hydrostatic bearings	F16C 29/025
Magnetic or electric bearings	F16C 32/04
Vibration dampers	F16F 9/00
Measuring by electric or magnetic means	G01B 7/00
Interferometers	G01B 9/02
Measuring by optical means (e.g. for alignment)	G01B 11/00
Measuring optical phase differences	G01J 9/00
Inspection by optical means	G01N 21/00
Measuring electric or magnetic variables	G01R
Measuring ionising radiation	G01T 1/00
Microscopes	G02B 21/00
Masks, i.e. mask manufacture, inspection, cleaning, repair	G03F 1/00
Lithography applications (e.g. holography, imprint)	G03F 7/00
Photosensitive materials	G03F 7/004
Exposure	G03F 7/20
Exposure strategies	G03F 7/213
Photolithography, e.g. high resolution photolithography	G03F 7/70
Mask-workpiece alignment in photolithography	G03F 9/70
Control and regulating systems	G05B
Lithographic production of optical disks	G11B 7/26
Testing of semiconductor devices during manufacture	H01L 22/00
Apparatus for manufacturing or treating semiconductors not provided elsewhere	H01L 21/67005
Workpiece handling	H01L 21/677
Marks on workpieces (e.g. alignment marks)	H01L 23/544
Linear motors	H02K 41/02